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# **Environmental Control Technology Survey of Selected U.S. Strip Mining Sites**

**Water Quality Impacts and Overburden Chemistry  
of Indiana Study Site**

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ENVIRONMENTAL CONTROL TECHNOLOGY  
SURVEY OF SELECTED U.S. STRIP MINING SITES

Water Quality Impacts and Overburden  
Chemistry of Indiana Study Site

by

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and Andrew A. Sobek

Energy and Environmental Systems Division

December 1982

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Division of Environmental Control Technology

\*Environmental Impact Studies Division



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## FOREWORD

The Argonne National Laboratory (ANL) program entitled "Environmental Control Technology Survey of Selected U.S. Strip Mining Sites" is being funded by the U.S. Department of Energy (DOE). The program was established in 1975 by an interagency agreement between DOE's precursor -- the U.S. Energy Research and Development Administration -- and the U.S. Environmental Protection Agency (EPA).

This program has a twofold purpose which is related in part to the interests of its two federal sponsors. The overall issue addressed by both sponsors is the need to satisfy increased coal demand in an environmentally acceptable manner. Each sponsor, however, has particular interests: DOE is interested in the efficacy and practicability of coal mine effluent control options currently in use, an identification of control technology problems and needs, and recommendations for research in these areas; the EPA was interested in an assessment of the validity of its effluent limitations guidelines and new source performance standards for the coal mining industry, with this assessment emphasizing seasonal and climatic variation impacts on effluent quantity and quality. A program plan was outlined to (1) project future coal production levels to the year 2000 as a basis for selection of case study mines, (2) gather data on effluent volumes and characteristics at surface mine case study mines, (3) examine the efficacy and economics of current effluent-control systems (treatment facilities and settling ponds), (4) assess the validity of the effluent guidelines, and (5) evaluate potential environmental impacts related to increased surface mining.

Summaries of the program's various aspects are being published in several volumes. Water quality data gathered at the case-study sites are analyzed in terms of potential local impacts in Argonne report ANL/EMR-2, Volumes 2A-2C, and in several reports in the ANL/EES-TM- series. All sites were coded using state abbreviations in order to protect the identity of individual mines. In ANL/EMR-2, Volume 3, the efficacy and economics of the various types of control technologies are examined, along with physical and chemical characteristics of treatment waste products. Report ANL/EMR-2, Volume 4, contains an assessment of the EPA effluent limitations guidelines (and those of the U.S. Dept. of Interior's Office of Surface Mining) for the coal mining industry relative to the data collected under this program. Thus, this entire set of reports examines the efficacy of various control technology options and assesses the potential environmental impacts related to increased surface mining based on detailed case-study site data.

## PROGRAM STAFF

The following staff members at ANL were responsible for specific sections of the Indiana report:

John Henricks:	General description of mine area; mining operation; general geology and soils.
Jean Bogner:	Overburden and coal geochemistry; control technology; water quality data.
Andrew Sobek:	Acid-base account and water-quality considerations related to overburden chemistry.
Robert Vocke:	Quality control for consultants; environmental effects; water quality sampling locations and analytical methods.

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ACKNOWLEDGMENTS

Our thanks go to all those individuals and organizations whose cooperation assistance, and advice have been helpful in the preparation of this report.

Water and overburden sampling and analyses were performed under the direction of J.L. Guernsey of Indiana State University under subcontract to Argonne National Laboratory. This report uses analytical data and background, descriptive, and explanatory material from the subcontractor's final report (Guernsey et al., 1977). While this work forms the basis for the present report, Argonne accepts sole responsibility for its conclusions and interpretations.

We also wish to thank the National Coal Association and its Water Quality Committee for guidance during the formation of the study and for their aid in securing the cooperation of the participating coal company. The company's cooperation and the assistance of key personnel have been acknowledged in letters to the company's corporate office.

Special thanks are due to John Reiter, Paul Smedinghoff, Madeline Antos, James McIntyre, and Barbara Rogowski for data processing, computer programming, retrievals, and word processing. Valuable editorial assistance was provided by Charles Malefyt.



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ABSTRACT

As part of a program to examine the ability of existing control technologies to meet federal guidelines for the quality of aqueous effluents from coal mines, an intensive study of water quality was conducted at a surface coal mine in Indiana during 1976 and 1977. Sampling was conducted every two weeks during the period May 1976-August 1977 at discharges draining both active mining and spoil areas, as well as at receiving streams. Values of pH, dissolved iron, and manganese were within applicable OSM limits in mine discharge, but the total suspended solids limit was occasionally exceeded. The overburden at this site consists of calcareous till over shales with highly variable sulfur content.

1 LOCATION AND DESCRIPTION OF MINE AND SURROUNDING AREA

1.1 GENERAL DESCRIPTION OF MINE AREA AND LOCAL COAL PRODUCTION

Mine IN-1 is located in western Indiana in the southeastern part of the Eastern Interior Basin. Coal mining began at the IN-1 site in 1928, but the current operation dates from 1941. The mine is operated as a conventional area surface mine, with overburden removed by dragline. Production for the past five years has averaged about 1.0 million tons (0.9 t) annually, and the projected mine life is 25 years. Surface coal production in 1977 was about 6.5 million tons in the immediate area of IN-1 (McGraw-Hill, 1979).

1.2 PHYSIOGRAPHY, TOPOGRAPHY, AND CLIMATE

IN-1 lies within the Wabash Lowland in an area of slightly rolling topography. At the mine, surface elevation ranges from 540 to 630 ft (165-192 m). The area is covered by glacial till. Drainages have poorly developed dendritic patterns, narrow flood plains, and are separated by broad upland divides. On the mine site, the streams are all narrow and steeply graded. Drainage from the mine area eventually flows into the Wabash River.

The climate of the IN-1 area is midcontinental, with temperatures averaging as high as 86°F (30°C) during July and as low as 17°F (-8°C) during January. Precipitation averages 37 in (94 cm) in the area, coming mostly during frequent spring and summer thunderstorms. During this study, however, annual precipitation averaged only 27 in.

### 1.3 GENERAL GEOLOGY AND SOILS

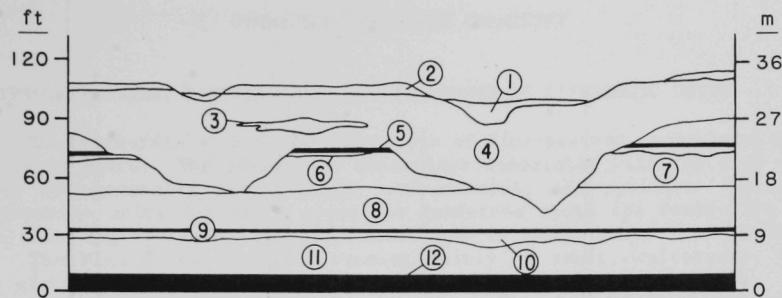
The overburden at Mine IN-1 consists of Pennsylvanian sedimentary rocks and Quaternary glacial, eolian, and alluvial sediments and soils (Figure 1). The coals mined are two coals in the Staunton Formation, the Seelyville (No. 3) and an unnamed coal, and the Colchester Coal (No. 3a) in the Linton Formation. The No. 3 coal is the main producer and varies from 4.8 to 7.5 ft (1.5 to 2.3 m) thick at the mine. The unnamed Staunton Formation coal is 1.6 ft thick and the No. 3a coal ranges from 0.5 to 1 ft thick. The Servant (No. 4) coal occurs at the top of the section and is mined where it has not been removed by glacial processes. It varies from 1.5 to 3 ft in thickness.

The over- and innerburdens associated with these coals are Pennsylvanian argillaceous shales and claystones, and occasional sandstone lenses and beds. The only thick sandstone unit present is the 10-ft bed overlying the No. 3 coal. The only persistent limestone unit is 0.6 to 1 ft thick and lies about 1 ft above the No. 3a coal. Overlying these Carboniferous rocks are varying thicknesses of Pleistocene glacial sediments. Most of this is 34 to 60 ft of calcareous Illinoian till, the upper 5 ft of which has been weathered and carbonate-leached. This till sheet is overlain by up to 3 ft of weathered loess and up to 22 ft of Recent alluvial sediments.

The soils in the mine area consist of the Iva, Ava, and Cincinnati series. The Iva series covers approximately 65% of the mine area. It consists of deep, poorly drained soil formed from loess on level to gently sloping terrain. These soils have a high available water capacity and low permeability. The Ava series covers approximately 30% of the land in the IN-1 area. This series is moderately well drained and forms on loess on gently sloping terrains. These soils are quite acid and have a moderate water capacity and low permeability. The Cincinnati series covers approximately 5% of the land in the mine area. These soils form in loess and till on moderate to steep slopes on uplands and are well drained; they have a moderate water capacity and low permeability.

### 1.4 CONTROL TECHNOLOGY AT MINE IN-1

At Mine IN-1, effluent from the active mine pit is pumped over the highwall into a long drainage channel with sparsely vegetated channel banks. No chemical treatment is used. Several settling ponds located on the perimeter of the site receive drainage from reclaimed spoils and unmined areas, some drainage from the preparation plant, and a portion of the drainage from the active pit.



YOUNGEST TO OLDEST		RANGE IN THICKNESS	
		(ft)	(m)
<u>RECENT</u>			
(1)	Alluvial clay, sand, and gravel	0 to 22	0 to 7
<u>PLEISTOCENE</u>			
(2)	Thin veneer of weathered loess	0 to 3	0 to 1
(3)	Sand and gravel lenses	3 to 20	1 to 6
(4)	Illinoian till	34 to 60	10 to 18
<u>PENNSYLVANIAN</u>			
Linton Formation			
(5)	Survant Coal (4)	1.5 to 3	0.6 to 1
(6)	Underclay, gray	0.6 to 3	0.2 to 1
(7)	Sandy shale; alternates with sandstone in many places	25 to 35	8 to 11
(8)	Shale, black; contains the fossiliferous Velpen Limestone Member (0.6 to 1 ft)	9 to 12	3 to 4
(9)	Colchester Coal Member (3a)	0.5 to 1	0.2 to 0.3
(10)	Underclay, light gray	0 to 3	0 to 1
(11)	Sandy shale, gray; in places the Coxville Sandstone Member replaces the sandy shale. Where present, such a sand body may increase the Seelyville-Colchester Coal interval to as much as 60 ft.	7 to 16	2 to 5
Staunton Formation			
(12)	Seelyville Coal Member (3)	4.8 to 7.5	1.5 to 2.3

Fig. 1 Generalized Sketch of IN-1 Highwall, Showing Gross Rock Relationships and Lithologic and Mineralogic Characteristics (after Wiram, 1973)



## 2 OVERBURDEN AND COAL CHEMISTRY

## 2.1 IDENTIFICATION, DISTRIBUTION, AND THICKNESS OF LITHOLOGIC UNITS

The overburden at Mine IN-1 consists of fine-grained Pennsylvanian and Pleistocene units. The shales and underclays associated with the coal units present are generally dark-colored, carbonaceous, and pyritic. Accessory Pennsylvanian units include a micaceous sandstone above the Seelyville Coal and a thin argillaceous limestone about 0.6 ft thick above the Colchester Coal. The Pleistocene deposits consist mainly of sandy, calcareous, Illinoian glacial till overlain by laminated lacustrine silts and clays. Both the till and the lacustrine deposits are generally overlain by a few feet of (Wisconsinan) Peoria Loess. Figure 2 is a representative stratigraphic section for the the highwall at Mine IN-1. The total thickness of the Pennsylvanian section is about 42 ft; the calcareous Illinoian till is approximately 52 ft thick, with the lacustrine deposits attaining a maximum of about 15 ft. The maximum composite thickness of the three coals at Mine IN-1 is about 10.6 ft.

## 2.2 SAMPLING PROCEDURES

At Mine IN-1, representative splits of three overburden cores were obtained by the consultant. Core L88JH was taken from the southwest corner of the mine and was used for the overburden chemical analyses because it closely reflects the lithologic sequence in the study area (Guernsey et al., 1977). Cores K185B and K260D were examined for inclusion of the lithologic variations across the mine area as a whole (Guernsey et al., 1977). Taken together, the three cores define a north-south cross-section about 3 mi (5 km) in length.

## 2.3 LITHOLOGIC AND MINERALOGIC CHARACTERISTICS OF COAL AND OVERBURDEN

The lithologic and mineralogic characteristics of the coal and overburden at Mine IN-1 are given in Figure 1, which includes a sketch of the variation of units across the highwall. Figure 3 is a cross-section indicating the variation in units north and south of the mine site, using the available rock cores. Starting at the bottom, the underclay below the unnamed Staunton coal is black, carbonaceous, fissile, but without visible pyrite. A black fissile carbonaceous shale with visible pyrite overlies the coal. This unit tends to thin toward the south. Overlying the carbonaceous shale is a dark gray carbonaceous, pyritic underclay which thins toward the south. Above the intervening No. 3 Coal, the basal Linton Sandstone also thins toward the south; in general, this unit is light gray, medium-grained, micaceous, contains a few carbonaceous partings, and does not weather rapidly. The Linton is overlain by a gray carbonaceous underclay with visible pyrite. Above the intervening No. 3a Coal is a hard black, laminated claystone with pyritized plant fossils. The claystone is overlain by a persistent argillaceous limestone that, in turn, is overlain by another laminated claystone with pyritized plant fossils. A dark gray laminated claystone tops the Pennsylvanian sequence. The Pleistocene deposits consist of sandy, calcareous Illinoian glacial till overlain by loess. Thus, the overburden at Mine IN-1 is dominated by carbonaceous, pyritic, argillaceous units and sandy calcareous till.

		FORMATION AND MEMBER		LITHOLOGY
SYSTEM	SERIES	Atherton Formation	Peoria Loess	
PENNSYLVANIAN	Alleghenian	Quaternary	Atherton Formation	
				Peoria Loess
		Pleistocene	Jessup Formation	Butlerville Till
			Linton Formation	Shale
				Shale
				Velpen Limestone
				Shale
				Colchester Coal - No. 3a
				Underclay
		Staunton Formation		Coxville Sandstone
				Seelyville Coal - No. 3
				Underclay
				Shale
				Coal ("sump vein")
				Underclay

Fig. 2 Representative Stratigraphic Section of IN-1 Highwall

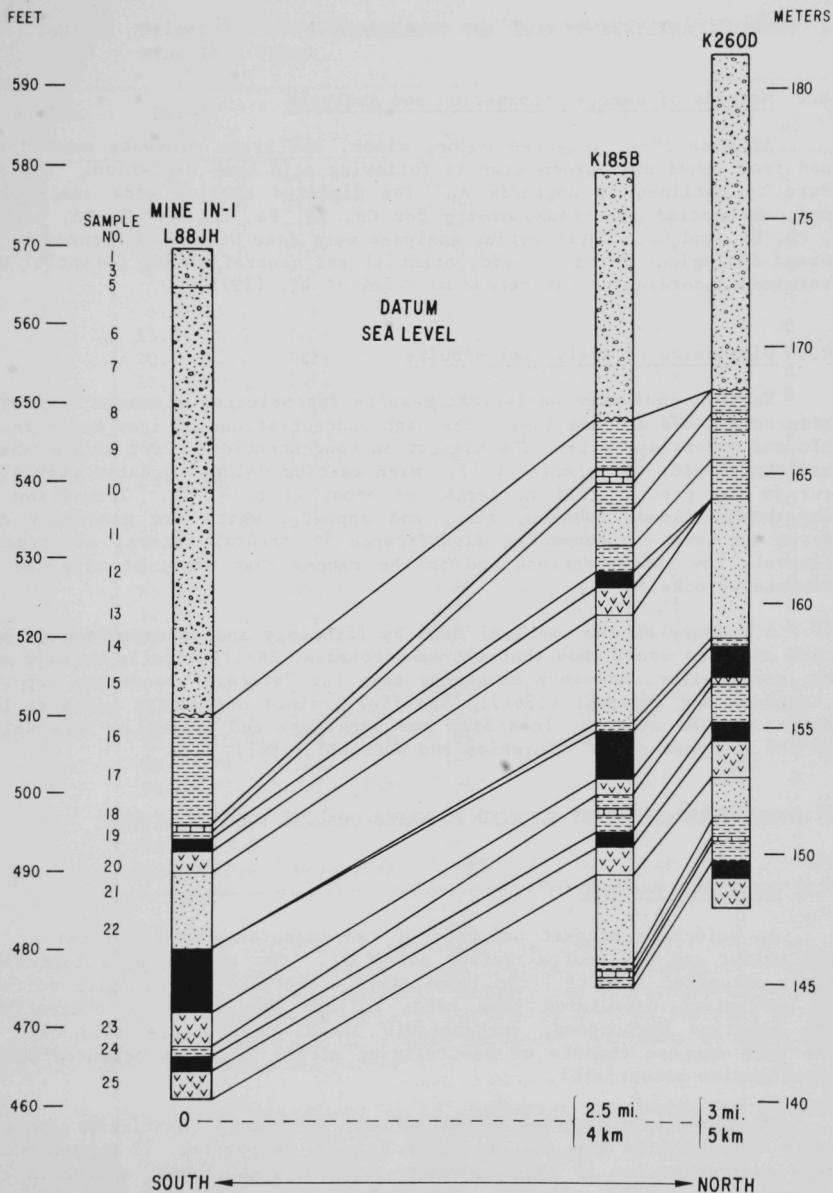


Fig. 3 Cross-Section at and near Mine IN-1, Based on Available Cores

## 2.4 CHEMICAL ANALYSES OF COAL AND OVERTBURDEN

### 2.4.1 Methods of Sample Preparation and Analysis

At Mine IN-1, selected major, minor, and trace elements were determined from ashed overburden samples following acid bomb digestion. The procedure is outlined in Appendix A. The digested samples were analyzed by atomic absorption spectrophotometry for Ca, Mg, Fe, Mn, Na, K, Zn, Sr, Cd, Cu, Pb, Ni, and Cr. Total sulfur analyses were done on a Leco furnace by the Indiana Geological Survey. Acid potential and neutralization potential were determined according to the method of Sobek et al. (1978).

### 2.4.2 Discussion of Analytical Results

Table 1 indicates analytical results for selected elements from overburden core L88JH at Mine IN-1. The high concentrations of iron occur in the shale and underclay units. The highest Mn concentrations occur in the shales immediately below the glacial till. High calcium values (greater than 4.5%) occur in the glacial till at depths of about 11 to 47 ft. Transition and heavy metals (lead, cadmium, zinc, and copper), which are generally considered to have environmental significance in natural waters, occurred in relatively low concentrations and in the ranges that might be expected for sedimentary rocks.

A summary of the chemical data by lithology and a comparison to published analyses would show that the sandstones at IN-1 generally contain more iron, more sulfur, and more manganese than the "average" sandstone reported by Turekian and Wedepohl (1961). The fine-grained overburden units at IN-1 contain, on the average, less iron and manganese and generally less sulfur than the "average shale" (Turekian and Wedepohl, 1961).

## 2.5 OVERTBURDEN CHEMISTRY RELATED TO WATER QUALITY CONSIDERATIONS

### 2.5.1 Acid-Base Account

An acid-base account consists of two measurements: (1) total or pyritic sulfur and (2) neutralization potential. The accounting balances the maximum potential acidity (from immediately titratable sources plus sulfuric acid equivalent calculated from total sulfur) against total neutralizers (from alkaline carbonates, exchangeable bases, weatherable silicates, or other rock sources capable of neutralizing strong acids as measured by the neutralization potentials).

The total, or pyritic, sulfur content accurately quantifies potential acidity of materials when all sulfur is present as pyrite. If gypsum occurs in the overburden, or if the overburden rocks are weathered, sulfur is also present in the form of sulfates. Samples high in organic carbon usually contain organic sulfur. If these nonacid-producing forms of sulfur are present, the maximum potential acidity as calculated will be too high. For this reason, such calculations are referred to as maximums, and in doubtful cases,

Table 1 Selected Elemental Analyses of Overburden from Core L88JH,  
Mine IN-1 (ppm)

Sample No.	Depth (ft)		Lithology	Zn	Sr	Cd	Cu	Pb	Ni
1	1.0-	2.0	Till	0.05	0	0	0	0	0
2	2.0-	3.0	Till	0.045	0	0	0	1.7	0
3	3.0-	4.0	Till	0.05	0	0	0.05	0	0
4	4.0-	5.0	Till	0.055	0	0	0	0	0
5	5.0-	6.0	Till	0.055	0	0	0	0	0
6	6.0-	15.0	Till	0.05	0	0	0	0	0
7	15.0-	20.0	Till	0.055	0	0	0.05	1.7	0
8	20.0-	25.0	Till	0.055	0	0	0	1.7	0
9	25.0-	30.0	Till	0.05	0	0	0.05	0	0
10	30.0-	35.0	Till	0.055	0	0	0	0	0
11	35.0-	40.0	Till	0.045	0	0	0	0	0
12	40.0-	45.0	Till	0.055	0	0	0	0	0
13	45.0-	50.0	Till	0.05	0	0	0	0	0
14	50.0-	55.0	Till	0.055	0	0	0	0	0
15	55.0-	60.0	Till	0.055	0	0	0	0	0.01
16	60.0-	65.0	Shale	0.06	0	0	0	0	0.01
17	65.0-	70.0	Shale	0.07	0	0	0	0	0.01
18	70.0-	75.0	Shale	0.08	0	0	0.05	0	0
19	75.0-	76.2	Shale	0.95	0	1	0.1	0	0.01
20	76.2-	77.2	Coal	--	--	--	--	--	--
21	77.2-	80.2	Underclay	0.055	1	0	0	0	1
22	80.2-	85.0	Sandstone	0.05	0	0	0	0	0
23	85.0-	90.0	Sandstone	0.06	0	0	0	1.7	0.01
24	90.0-	98.0	Coal	--	--	--	--	--	--
25	98.0-102.4		Underclay	0.045	1	1	0	0	0
26	102.8-103.8		Shale	0.05	0	0	0	0	0.10
27	102.8-103.8		Coal	--	--	--	--	--	--
28	103.8-105.4		Underclay	0.085	0	0	0.1	0	0.02

appropriate acid and water leachings should be made to rule out those forms of sulfur that do not produce acid. Then from the stoichiometric equation of pyrite oxidation, the maximum potential acidity can be calculated in terms of  $\text{CaCO}_3$  equivalent. Overburden material containing 0.1% sulfur (all as pyrite) yields an amount of sulfuric acid that requires 3.125 tons of  $\text{CaCO}_3$  to neutralize 1000 tons of the overburden.

The neutralization potential of overburden materials, the second component of a net acid-base account, measures the amount of neutralizers present in the overburden materials. This measurement is found by treating a sample with a known amount of standardized HCl, heating to assure complete reaction, and titrating with a standardized base. The result is then expressed in  $\text{CaCO}_3$  equivalent. When balanced against acidity from the total sulfur measurement, a net acid-base account can be made.

From the acid-base account, potentially toxic material is defined as any rock or earth material having a net potential deficiency of 5.0 tons of  $\text{CaCO}_3$  equivalent or more per 1000 tons of material. The 1000 tons is based on the assumption that an acre plow-layer contains 2 million lb of soil. Regardless of the acid-base account, materials with a pH of less than 4.0 (pulverized rock slurry in distilled water) are defined as being acid-toxic.

#### 2.5.2 Results and Discussion

The acid-base account for the overburden at this mine indicates that a large zone of nontoxic, calcareous material extends from the surface to a depth of 60 ft (Table 2). Carbonate content ranges from a low of 1.3% to a high of 32.17%, while total sulfur content was assumed to be approximately zero.

Below the glacial till, the Pennsylvania shales are relatively unweathered as evidenced by the dull gray colors of the material that indicate reduced iron. The overburden rock from 60 to 109.4 ft below the surface has a net acid-base balance that exceeds the potentially acid-toxic definition of 5 tons  $\text{CaCO}_3$ /1000 tons material. By this definition, only Samples 17 and 19 are not potentially acid-toxic. This is the result of an increase in sulfur content and a decrease in the amount of bases (carbonates) in the rock.

Proper handling of the overburden is all that is needed at this site to produce a nonpolluting minesoil after reclamation. The material that is potentially acid-toxic should be blended with the calcareous till or buried in the pit so that the calcareous till surrounds the potentially acid-toxic rock.

Table 2 Acid-Base Balance for Overburden, Mine IN-1

Sample No.	Depth (ft)	Rock Type <sup>a</sup>	Total Sulfur (%)	Tons CaCO <sub>3</sub> Equivalent/1000 Tons Material			
				Maximum from % Total Sulfur (Acid Potential)	Amount Present (Neutralization Potential)	Maximum Needed (pH 7.0)	Excess CaCO <sub>3</sub>
1	1.0-	2.0	Till	-	-	-	-
2	2.0-	3.0	Till	-	-	-	-
3	3.0-	4.0	Till	-	-	-	-
4	4.0-	5.0	Till	-	-	13.30	13.3
5	5.0-	6.0	Till	-	-	48.50	48.5
6	6.0-	15.0	Till	-	-	258.30	258.3
7	15.0-	20.0	Till	-	-	258.30	258.3
8	20.0-	25.0	Till	-	-	247.90	247.9
9	25.0-	30.0	Till	-	-	255.70	255.7
10	30.0-	35.0	Till	-	-	203.70	203.7
11	35.0-	40.0	Till	-	-	203.70	203.7
12	40.0-	45.0	Till	-	-	321.70	321.7
13	45.0-	50.0	Till	-	-	94.20	94.2
14	50.0-	55.0	Till	-	-	60.50	60.5
15	55.0-	60.0	Till	-	-	19.2	19.2
16	60.0-	65.0	SH	2.5	78.12	67.74	-
17	65.0-	70.0	SH	1.8	56.25	77.34	21.09
18	70.0-	75.0	SH	3.25	101.56	38.00	63.56
19	75.0-	76.2	SH	1.4	43.75	42.80	0.95
20	76.2-	77.2	Coal	-	-	-	-
21	77.2-	80.2	UC	1.04	32.5	-	32.50
22	80.2-	85.0	SS	0.24	7.5	-	7.50
23	85.0-	90.0	SS	0.41	12.81	-	12.81
24	90.0-	98.0	Coal	-	-	-	-
25	98.0-102.4	UC	2.3	130.94	-	130.94	-
26	102.8-103.8	SH	-	71.87	-	71.87	-
27	103.8-105.4	Coal	1.9	-	-	-	-
28	105.4-109.4	UC	-	59.37	-	59.37	-

<sup>a</sup>SH = shale; UC = underclay; SS = sandstone.



### 3 HYDROLOGY AND WATER QUALITY

#### 3.1 INTRODUCTION

Drainage from the mined area eventually flows into the Wabash River. Water quality and quantity data for the immediate mine area are sparse except for data generated during this study. Overall, water quality is fairly good, with pH generally between 7 and 8.

#### 3.2 LOCATION AND FREQUENCY OF DATA COLLECTION

Locations of water quality monitoring stations at the site were selected by ANL personnel and consultants between June 1976 and February 1977 (Figure 4). Stations 2 and 3 were selected to provide water quality data for

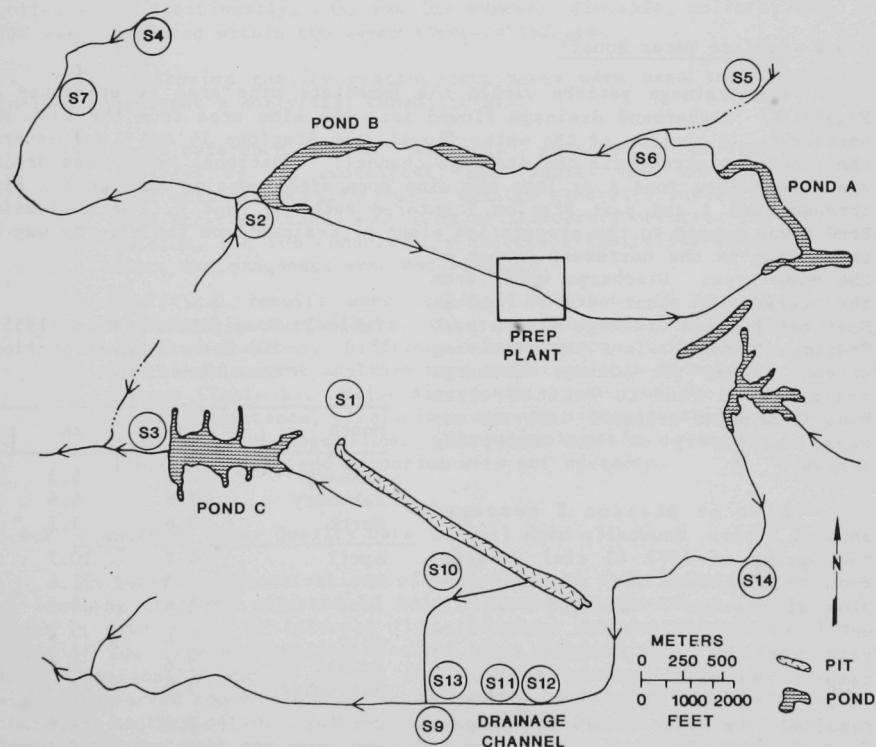


Fig. 4 Surface Drainage and Water Sampling Stations at Mine IN-1

settling pond discharges. Stations 4, 5, 7, and 14 were selected to provide background water quality information. Stations 6, 9, and 10 were selected to provide additional mine site water quality data. Stations 1, 8, and 11-13 were discontinued during the study.

Water samples were collected 27 times during the 13-month course of the project at approximately two-week intervals.

### 3.3 HYDROLOGY OF THE MINE AREA

#### 3.3.1 Precipitation

Average yearly precipitation (Table 3) in western Indiana is about 37 in. (94.7 cm). Precipitation during this study period was below average (27.5 inches in 1976). Precipitation data for the study period are presented in Figure 2.

#### 3.3.2 Surface Water Runoff

The drainage pattern within the immediate mine area is presented in Figure 3. Background drainage flowed into the mine area from the east and northeast. A portion of the water flowed past Stations 14 and 9 and entered the receiving stream via the drainage channel. Additional background drainage flowed into Pond A or into the mine area after passing Station 5. Flow through Pond A and past Station 5 entered Settling Pond B. Water leaving Pond B was pumped to the preparation plant or drained from the site by way of the stream in the northwest corner of the mine area. Discharge water from the preparation plant entered Pond A. Most pit pumpage drainage flowed past Stations 9 and 10 into the receiving stream. Other pit pumpage discharge drained into Pond C. Outflow from Pond C drained westward into an unnamed tributary of the receiving stream.

Flow at Station 2 averaged about 0.2 cfs. Unusually high flow in the spring of 1977 (3 cfs) resulted from melting snow and spring rains. Flow at Station 3 averaged 0.25 cfs until spring 1977, after which flow rate varied greatly (0.01 to 0.75 cfs). The peak flow at Station 3 during June 1977 (0.75 cfs) probably resulted from above normal pit pumpage into the settling pond. Stations 4, 5, and 7 were dry or not flowing much of the time. Peak flows occurred at these stations during 1977 spring

Table 3 Precipitation Data (1955-70) for a Weather Station near Mine IN-1

Month	in.	cm
January	2.1	5.3
February	1.8	4.6
March	2.8	7.1
April	4.2	10.7
May	4.5	11.4
June	3.8	6.3
July	4.6	11.7
August	2.6	6.6
September	3.1	7.9
October	2.1	4.6
November	3.2	8.1
December	2.5	5.0
Total	37.3	94.7

rains (1.75, 0.75, and 2.0 cfs, respectively). Flow at Station 6, which received coal-processing water, was relatively constant (1.0 cfs) during most of the study. Flow at Station 9, which received pit pumpage, was relatively low (<0.2 cfs) until spring 1977, after which the flow was generally higher and more irregular (maximum 2.5 cfs). Flow at Station 10 was very irregular (0 to 1.0) depending on whether the pump was operating. Station 14 was dry much of the time, with a small peak flow during March 1977 (0.2 cfs).

### 3.4 WATER QUALITY

#### 3.4.1 Methods of Water Sample Collection, Analysis, and Quality Control

Specific conductance, pH, and dissolved oxygen measurements were made in the field. Water samples were collected in acid-washed polyethylene bottles. Samples for metal analyses were acidified with HNO<sub>3</sub>. Unacidified samples were analyzed for chloride, pH, alkalinity, and acidity on data of collection. Additionally, analyses for ammonia, fluoride, sulfate, TDS, and TSS were completed within two weeks after collection.

The following quality control procedures were used to evaluate the Indiana consultant's analytical capabilities:

- Three reference samples ("unknowns") prepared by ANL were analyzed by the consultant, and results were compared with actual concentrations. Results generally indicated good accuracy (Table 4). A major inaccuracy occurred for calcium, and the consultant's detection limits for iron, zinc, and manganese were not adequate.
- Analytical results were compared from sets of samples collected concurrently by the consultant and by ANL at selected stations. Differences between most constituents in the consultant analyses were usually within acceptable ranges (Table 5). Major discrepancies occurred for specific conductance, alkalinity, ammonia nitrogen, sulfate, calcium, and magnesium. The consultant's detection limits for iron and strontium were not adequate.

#### 3.4.2 Summary of Water Quality Data

In general, concentrations of most chemical constituents were highest at sampling stations affected by main drainage and showed an inverse relationship with known or inferred flow. Highest concentrations occurred at times of low flow at sampling stations that received pit drainage; for example, Stations 9 and 10 during fall 1976 and summer 1977 exhibited the highest observed concentrations for most measured species. Sampling stations chosen as background locations (4, 5, 7, and 14) had the lowest observed concentrations for most species. Stations 1, 2, 3, and 6 exhibited intermediate concentrations except during times of high flow, when dilution occurred (February and March 1977). Detailed water quality data are given in Appendix B.

Table 4 Results of Reference Sample Analyses (in mg/L unless other noted)

Sample No.	Parameter	Actual Concentration	Consultant Concentration
1	Iron	0.025	<1.00
	Zinc	0.025	<0.10
2	Calcium	50	150
	Iron	0.5	<1
	Magnesium	20	25
	Manganese	0.1	<0.1
	Potassium	10	11
	Sodium	50	56
	Strontium	0.5	0.6
3	Chloride	50	54
	Fluoride	0.25	0.275
	Spec. Conductance ( $\mu\text{mho}/\text{cm}$ )	1110	1000
	Sulfate	400	395
	TDS	675	667

Table 5 Comparison of Analyses on Concurrently Collected Samples (in mg/L unless otherwise noted)

Parameter	Sample 1		Sample 2	
	ANL	Consultant	ANL	Consultant
Specific Conductance ( $\mu\text{mho}/\text{cm}$ )	2232	2100	1005	750
pH	8.3	8.3	8.3	8.3
Acidity	0	16	0	4
Alkalinity	149	182	180	186
Chloride	8.5	8	8.2	13
Fluoride	0.27	0.3	0.28	0.3
Ammonia Nitrogen	0.25	2.3	1.08	1.3
Sulfate	1188	1075	300	300
Calcium	204	246	74	103
Iron	0.62	1	0.50	--
Magnesium	117	138	46	53
Manganese	0.58	0.6	0.28	0.2
Potassium	8.6	10	4.9	5
Sodium	128	117	38	35
Strontium	1.3	1	<0.5	1

With respect to specific parameters, pH was near neutral to slightly basic for all sampling stations except 7 and 9 in August 1977, when values of 4.25 and 3.50, respectively, were recorded. Conductivities ranged from about 250 to 1200 mho/cm at stations relatively unaffected by mine drainage to about 1400 to 4000 mho/cm at stations that had mine drainage contributions. The highest recorded conductivity was 5500 mho/cm at Station 10. Total dissolved solids were generally below 600 mg/L at background stations 4, 5, 7, and 14, although TDS as high as about 1300 mg/L was recorded at Station 5 during spring 1977. TDS at the other stations mainly ranged from above 1800 mg/L; wide fluctuations were apparent, however. Sulfate concentrations at all stations mirrored TDS values; generally, about one-half to two-thirds of the TDS could be attributed to the sulfate.

Again, at background stations the concentrations of calcium, magnesium, and sodium were quite low, with calcium concentrations (the highest of the three) generally less than 100 mg/L. Wide ranges in calcium, magnesium, and, to a lesser extent, sodium were observed at most sampling stations. Potassium values were fairly constant at all stations during the sampling period. The highest sodium values were recorded at Stations 9 and 10 during spring and summer of 1977. Iron concentrations, even at Stations 9 and 10, were generally below 10 mg/L with exceptions occurring at Stations 7 (spring 1977), and 9 and 10 (spring and summer 1977). Manganese was generally below 2 mg/L in all samples except at Stations 9 (late summer 1977) and 10 (spring 1977) when high values of 5.3 mg/L and 5.8 mg/L, respectively, were recorded. Values for zinc were at or near detection limits. Nickel values were also at or near detection limits, with the highest values recorded at Stations 9 and 10 (maxima of 1.4 and 1.0 mg/L, respectively). Chloride, fluoride, and strontium were measured in most samples but at low concentrations. Ammonia ranged from 1 to 4 mg/L in most samples, with higher values in samples from Stations 9 and 10; values at Station 10 were often above 20 mg/L.

Concentrations of TSS were generally below 100 mg/L. However, some exceptionally high values occurred in spring and summer 1977 at Stations 9 and 10, where values up to a maximum of 70,000 mg/L were recorded. This high value for TSS corresponded with relatively high flow rates. Probably the un-vegetated banks of the drainage channel at Mine IN-1 periodically contributed suspended solids in addition to the solids pumped from the mine pit.



## 4 DISCUSSION OF CONTROL TECHNOLOGY EFFECTIVENESS

This section discusses changes during the sampling period in the mine effluent parameters that are regulated by the U.S. Office of Surface Mining (OSM). The latest pertinent regulations consist of the final regulations made available for public comment by OSM in September 1978 (Federal Register, 1978). The federal regulations regarding surface mine effluents were finalized as the 1978 OSM regulations, which impose the effluent limitations shown in Table 6. Discharges at Mine IN-1 would fall into the "alkaline" category as defined in Footnote "c" of Table 6.

Figures 5 through 7 indicate changes through the sampling period for pH, Fe, and TSS. Comparing Station 10 to Station 3 for 18 cases, TSS and total Fe concentrations were less than the permitted daily maximum in 17 of

Table 6 OSM Effluent Guidelines

Effluent Characteristic <sup>a</sup>	Max. Allowable <sup>b</sup>	Average of Daily Values for 30 Discharge Days
Iron, total	7.0 mg/L	3.5
Manganese, total <sup>c</sup>	4.0 mg/L	2.0
Total suspended solids <sup>d</sup>	70.0 mg/L	35.0
pH	6.0 to 9.0	---

<sup>a</sup>To be determined according to collection and analytical procedures adopted by the EPA's regulations for waste water analyses (40 CFR 136).

<sup>b</sup>Based on representative sampling.

<sup>c</sup>The manganese limitation shall not apply to discharges that are alkaline as defined by the EPA (40 CFR 434). Where the application of neutralization and sedimentation treatment technology results in inability to comply with the manganese limitations set forth, the regulatory authority may allow the pH level in the discharge to exceed to a small extent the upper limit of 9.0 in order that the manganese limitations will be achieved.

<sup>d</sup>In Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming, total suspended solids limitations will be determined on a case-by-case basis, but they must not be greater than 45 mg/L (maximum allowable) and 30 mg/L (average of daily value for 30 consecutive discharge days) based on a representative sampling.

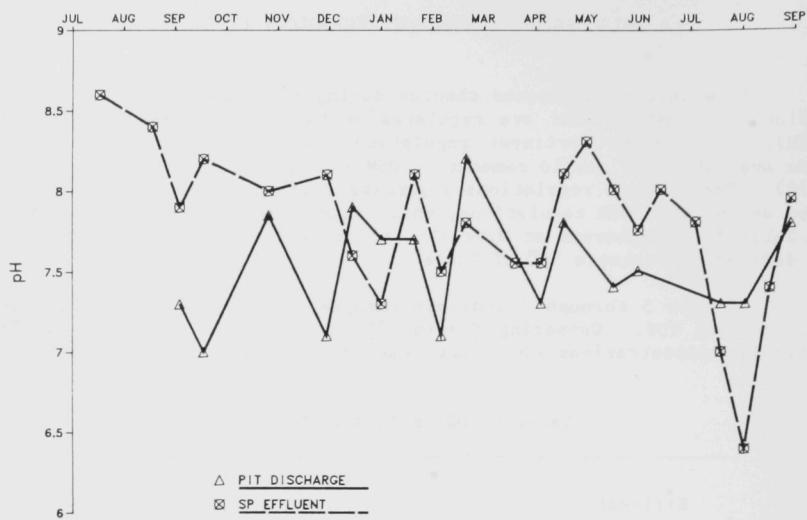


Fig. 5 Variations in pH at Station 10 (Pit Discharge) and Station 3 (SP Effluent)

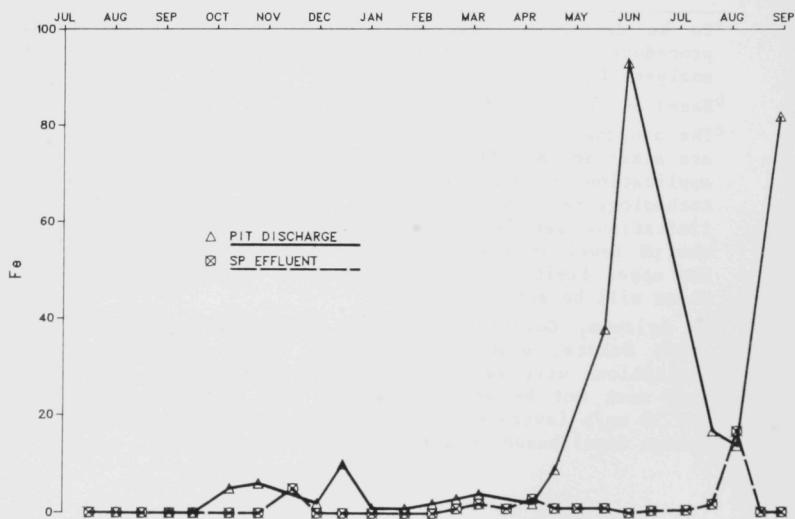


Fig. 6 Variations in Fe at Station 10 (Pit Discharge) and Station 3 (SP Effluent)

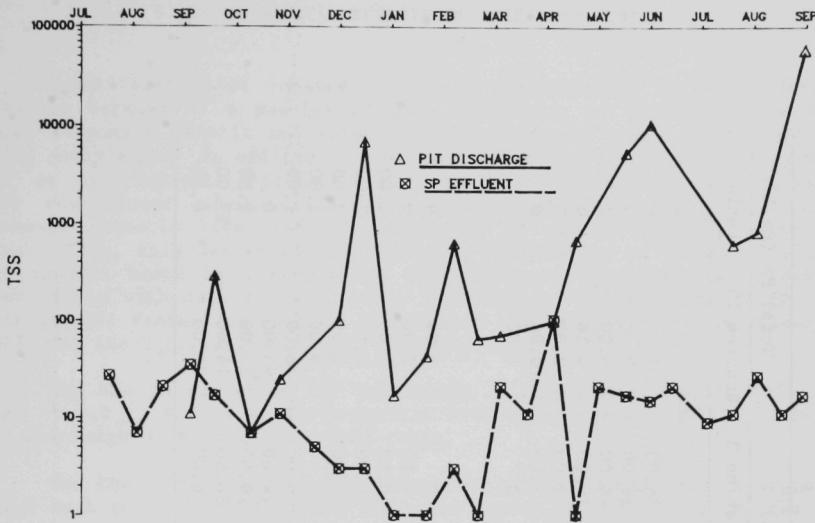


Fig. 7 Variations in TSS at Station 10 (Pit Discharge and Station 3 (SP Effluent)

the 18 cases. However, the initial TSS concentrations for Station 10 were extremely variable through the sampling period. Calculated loading rates for Station 3 had the following ranges:

Total Fe: 0.01-7.3 kg/day (Based on flow data for 14 sampling dates, mainly Feb.-Aug. 1977).

TSS: 0-250 kg/day (Based on flow data for all sampling dates).

Table 7 tabulates data for pH, TSS, and Fe at Stations 10 and 3. Station 10 includes pit drainage, some of which flows to settling pond C; Station 3 is the outlet of settling pond C. Pond C retains water from both unmined and spoils areas as well as some pit drainage. Water draining into the pond had TSS concentrations ranging from 6.0 mg/L to more than 69,000 mg/L; these were reduced in 17 of 18 cases to less than 35 mg/L. It is important to note that TSS concentrations at Stations 7 and 9 (the drainage channel) exceeded 70 mg/L in about half the samples, suggesting that this channel is especially ineffective at trapping suspended solids. This would be expected because of the channel's steep, nonvegetated banks.

Table 7 Comparison of pH, TSS, and Total Fe at Stations 3 and 10<sup>a</sup>

Date	pH <sup>b</sup>		TSS (mg/L)		Total Fe (mg/L)	
	Station 10	Station 3	Station 10	Station 3	Station 10	Station 3
<u>1976</u>						
Sept. 3	7.30 F	7.90 F	10.00	34.00	0	0
Sept. 17	7.00 F	8.20 F	290.00	16.00	0	0
Oct. 8	7.82 L	8.00 L	6.00	6.00	5.00	0
Oct. 25	7.85 F	8.00 F	24.00	10.00	6.00	0
Nov. 29	7.10 F	8.10 F	100.00	2.00	2.00	0
Dec. 14	7.90 F	7.60 F	6976.00	2.00	10.00	0
Dec. 31	7.70 F	7.30 F	16.00	0	1.00	0
<u>1977</u>						
Jan. 15	7.70 F	8.10 F	42.00	0	1.00	0
Jan. 31	7.10 F	7.50 F	632.00	2.00	2.00	0
Feb. 15	8.20 F	7.80 F	64.00	0.00	3.00	1.00
Feb. 28	7.10 L	6.99 L	70.00	20.00	4.00	2.00
Mar. 29	7.30 F	7.55 F	98.00	102.00	2.00	3.00
Apr. 12	7.80 F	8.10 F	680.00	0	9.00	1.00
May 11	7.40 F	8.00 F	5388.00	16.00	38.00	1.00
May 25	7.50 F	7.75 F	10580.00	14.00	93.00	0
July 13	7.30 F	7.00 F	614.00	10.00	17.00	2.00
July 27	7.30 F	6.40 F	828.00	26.00	14.00	17.00
Aug. 23	7.80 F	7.95 F	69150.00	16.00	82.00	0.50

<sup>a</sup>Zero in table indicates constituent not detected.<sup>b</sup>F = field; L = laboratory.

## 5 ENVIRONMENTAL EFFECTS ON RECEIVING STREAM

Quantification of impacts to aquatic environments from Mine IN-1 is difficult because of a paucity of data qualifying or quantifying environmental responses (biotic and abiotic) to constituent levels discharged from mining activities. In addition, constituent emission levels are highly variable as are ambient physicochemical characteristics of receiving water. Lower constituent concentrations usually are required for protection of freshwater aquatic life than for protection of public drinking water supplies. Thus, this assessment is a general examination of potential biological impacts based on a comparison of constituent emission and receiving-water levels with data derived mainly from Quality Criteria For Water (U.S. Environmental Protection Agency, 1976) and a review by Cleland and Kingsbury (1977) for the U.S. Environmental Protection Agency (EPA).

The EPA pH criterion for protection of freshwater aquatic life is a range of 6.5 to 9.0 (U.S. Environmental Protection Agency, 1976). Only one IN-1 discharge of 6.4 violated this range.

The EPA iron criterion for protection of freshwater aquatic organisms is 1.0 mg/L (U.S. Environmental Protection Agency, 1976). Maximum iron concentrations of 1, 17, and 93 mg/L were reported at discharge Stations 2, 3, and 10, respectively. Maximum iron concentrations of 7, 2, and 35 mg/L were reported at background Stations 4, 5, and 7, respectively. In-stream iron concentrations were not substantially altered by settling pond discharges.

The EPA TSS criterion for protection of freshwater aquatic life is that solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10% from seasonally established norms for aquatic life (U.S. Environmental Protection Agency, 1976). Maximum TSS loads of 30, 102, and 69,150 mg/L were reported at discharge Stations 2, 3, and 10, respectively. Maximum TSS loads of 80, 38, and 198 mg/L were reported at background Stations 4, 5, and 7, respectively. TSS loads from discharges could have stressed receiving-stream biota.

EPA has not set a manganese criterion for protection of freshwater aquatic organisms. The EPC<sub>E</sub> of manganese in water is 0.02 mg/L (Cleland and Kingsbury, 1977). Maximum manganese concentrations of 1.0, 2.1, and 5.8 mg/L were reported at discharge Stations 2, 3, and 10, respectively. Maximum concentrations of 1.0, 0.3, and 1.0 mg/L were reported at background Stations 4, 5, and 7, respectively. Manganese discharges at Mine IN-1 probably had little adverse impact on receiving-stream biota.

EPA has not set a fluoride criterion for protection of freshwater aquatic organisms. McKee and Wolf (1971) recommended 1.5 mg/L fluoride for the protection of freshwater aquatic life. Maximum fluoride concentrations in IN-1 discharges were below this level. In-stream fluoride concentrations were not altered substantially by settling pond discharges.

EPA has not set a strontium criterion for protection of freshwater aquatic life. Bringmann and Kuhn (1959) found the threshold concentration for Daphnia is 210 mg/L strontium. Maximum strontium concentrations in IN-1 discharges were well below this level. In-stream strontium concentrations were not altered substantially by settling pond discharges.

EPA does not recommend a dissolved solids criterion for protection of freshwater aquatic life. The National Technical Advisory Committee to the Secretary of the Interior (1968) recommended maintaining osmotic pressure levels of less than that caused by a 15,000-mg/L solution of sodium chloride. Total dissolved solids loads at IN-1 did not exceed 6000 mg/L. Principal inorganic anions dissolved in water include carbonates, chlorides, sulfates, and nitrates (chiefly in groundwater). Principal cations are sodium, potassium, calcium, and magnesium (U.S. Environmental Protection Agency, 1978). Sulfate concentrations at IN-1 were much higher than chloride concentrations. Maximum sulfate concentrations of 2275, 2600, and 3200 mg/L were reported at discharge Stations 2, 3, and 10, respectively. Maximum sulfate concentrations of 125, 455, and 375 mg/L were reported at background Stations 4, 5, and 7, respectively. In-stream sulfate concentrations were increased by settling pond discharges, but probably had little impact on aquatic life.

In summary, discharges from IN-1 caused little degradation of water quality in receiving streams for biota when compared to background concentrations.

APPENDIXES



## ABBREVIATIONS USED IN APPENDIXES

Al	aluminum
Ammonia-N	nitrogen as ammonia
As	arsenic
Ba	barium
Ca	calcium
CaCO <sub>3</sub>	calcium carbonate
Cd	cadmium
Co	cobalt
Cond. or Sped. Cond.	specific conductance
Cr	chromium
Cu	copper
Diss. Oxygen or Diss. O <sub>2</sub>	dissolved oxygen
Fe	iron
gpm	gallons/minute
Hg	mercury
HNO <sub>3</sub>	nitric acid
K	potassium
LOI	loss on ignition
L/s	liters/second
Mg	magnesium
Mn	manganese
Mo	molybdenum
Na	sodium
Ni	nickel
Pb	lead
ppm	parts per million
PO <sub>4</sub>	phosphate
Si	silicon
Sr	strontium
TDS or TD Solids	total dissolved solids
Ti	titanium
TSS or TS Solids	total suspended solids
USBM	U.S. Bureau of Mines

USGS

V

Zn

U.S. Geological Survey

vanadium

zinc

## APPENDIX A

## SUMMARY OF ANALYTICAL METHODS AND DETECTION LIMITS



Table A.1 Summary of Analytical Methods and Detection Limits

Parameter	Analytical Method	Method Reference	Lower Detection Limit <sup>a</sup>
Acidity (pH 8.3; as CaCO <sub>3</sub> )	Electrometric titration	b	1.0
Alkalinity (pH 4.5; as CaCO <sub>3</sub> )	Electrometric titration	b	1.0
Chloride	Mohr Titration	b	0.5
Specific Conductance ( $\mu\text{mho}/\text{cm}$ )	Yellow Springs Instruments meter	c	---
Fluoride	Specific ion electrode	-	0.1
Ammonia-Nitrogen	Nesslerization	b	1.0
Dissolved Oxygen	Ecological Instruments Corp. meter	b	0.2
pH	Ecological Instruments Corp. meter	d	---
TDS	Residue on evaporation	b	1.0
TSS	Filtration	b	1.0
Sulfate	Turbidimetric	e	1.0
Cadmium	AAS <sup>f</sup>	b,g	1.0
Calcium	AAS	b,g	1.0
Chromium	AAS	b,g	1.0
Copper	AAS	b,g	1.0
Iron	AAS	b,g	1.0
Lead	AAS	b,g	1.0
Magnesium	AAS	b,g	1.0
Manganese	AAS	b,g	0.1
Nickel	AAS	b,g	1.0
Potassium	AAS	b,g	1.0
Sodium	AAS	b,g	1.0
Strontium	AAS	b,g	1.0
Zinc	AAS	b,g	1.0

<sup>a</sup>All parameters reported as mg/L except where noted.<sup>b</sup>Brown et al. (1970).<sup>c</sup>Yellow Springs Instruments instructions.<sup>d</sup>Ecological Instruments Corporation instructions.<sup>e</sup>Ewing (1960).<sup>f</sup>Atomic Absorption Spectroscopy.<sup>g</sup>Perkin-Elmer Corp.



APPENDIX B  
HYDROLOGY AND WATER QUALITY DATA



ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
10/08/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		15.0	15.0			
COND	DO	PHL	TSS	TDS	ALK	
3600.000000	9.000000	6.850000	224.000000	3800.000000	520.000000	
CL	F	SO4	N-NH4	TCA	TCD	
12.000000	.300000	2450.000000	11.000000	445.000000	.000000	
TCR	TCU	TFET	TK	TMN	TNA	
.000000	.000000	7.000000	15.000000	1.700000	170.000000	
TNI	TPB	TSR	TZM			
.000000	.000000	4.000000	.000000			

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
10/25/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		12.0	13.0			
COND	DO	PHF	PHL	TSS	TDS	
3000.000000	10.600000	6.800000	6.750000	20.000000	3050.000000	
ALK	CL	F	SO4	N-NH4	TCA	
410.000000	10.000000	.300000	2200.000000	8.000000	420.000000	
TCD	TCR	TCU	TFET	TK	TMN	
.000000	.000000	.000000	5.000000	13.000000	1.300000	
TNA	TNI	TPB	TSR	TZN		
140.000000	.000000	.000000	4.000000	.000000		

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
11/15/1976

STATION DESC & LOCATION		WTEMP			
SUMP-PIT WATER		11.8			
COND	DO	PHL	TSS	TDS	ALK
3600.000000	10.800000	6.700000	12.000000	3844.000000	348.000000
CL	F	SO4	N-NH4	TCA	TCD
8.000000	.300000	2700.000000	12.000000	450.000000	.000000
TCR	TCU	TFET	TK	TMN	TNA
.000000	.000000	2.000000	15.000000	1.300000	170.000000
TNI	TPB	TSR	TZN		
.000000	.000000	4.000000	.000000		

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
11/29/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT	WATER	-4.5	11.0			
COND F	DO	PHF	PHL	TSS	TDS	
3500.000000	10.800000	6.900000	6.700000	12.000000	3870.000000	
ALK	CL	F	SO4	N-NH4	TCA	
546.000000	10.000000	.300000	2525.000000	12.000000	440.000000	
TCD	TCR	TCU	TFET	TK	TMN	
.000000	.000000	.000000	2.000000	15.000000	1.700000	
TNA	TNI	TPB	TSR	TZM		
170.000000	.000000	.000000	4.000000	.000000		

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
12/14/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT	WATER	9.0	15.8			
COND F	DO	PHF	PHL	TSS	TDS	
3500.000000	9.800000	7.500000	6.650000	82.000000	3738.000000	
ALK	ACID	CL	F	SO4	N-NH4	
546.000000	102.000000	7.000000	.200000	2700.000000	2.000000	
TCA	TCD	TCR	TCU	TFET	TK	
430.000000	.000000	.000000	.000000	3.000000	15.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
1.200000	160.000000	.000000	.000000	4.000000	.000000	

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
12/31/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT	WATER	-18.0	12.0			
COND F	DO	PHF	PHL	TSS	TDS	
4000.000000	10.600000	7.500000	6.550000	8.000000	3774.000000	
ALK	ACID	CL	F	SO4	N-NH4	
546.000000	148.000000	12.000000	.300000	2325.000000	5.000000	
TCA	TCD	TCR	TCU	TFET	TK	
400.000000	.000000	.000000	.000000	3.000000	15.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
1.200000	165.000000	.000000	.000000	4.000000	.000000	

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
01/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		-3.0	12.0			
COND	DO	PHF	PHL	TSS	TDS	
3750.000000	10.400000	7.100000	6.500000	6.000000	3800.000000	
ALK	ACID	CL	F	SO4	N-NH4	
548.000000	248.000000	10.000000	.300000	2150.000000	6.000000	
TCA	TCD	TCR	TCU	TFET	TK	
435.000000	.000000	.000000	.000000	3.000000	15.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
270.000000	1.200000	175.000000	.000000	.000000	4.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
01/31/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		-6.0	12.0			
COND	DO	PHF	PHL	TSS	TDS	
4000.000000	11.000000	7.500000	6.650000	8.000000	3758.000000	
ALK	ACID	CL	F	SO4	N-NH4	
552.000000	220.000000	9.000000	.300000	1925.000000	1.000000	
TCA	TCD	TCR	TCU	TFET	TK	
460.000000	.000000	.000000	.000000	3.000000	15.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
277.000000	1.100000	185.000000	.000000	.000000	4.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
02/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		-2.0	9.0			
COND	DO	PHF	PHL	TSS	TDS	
3800.000000	11.600000	7.200000	6.700000	30.000000	3130.000000	
ALK	ACID	CL	F	SO4	N-NH4	
244.000000	84.000000	8.000000	.300000	1925.000000	1.000000	
TCA	TCD	TCR	TCU	TFET	TK	
395.000000	.000000	.000000	.000000	2.000000	14.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
209.000000	1.000000	140.000000	.000000	.000000	3.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
02/28/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		5.5	5.0			
COND <sup>F</sup>	DO	PHF	PHL	TSS	TDS	
1100.000000	12.800000	6.300000	6.800000	28.000000	764.000000	
ALK	ACID	CL	F	SO4	N-NH4	
54.000000	20.000000	6.000000	.300000	325.000000	.000000	
TCA	TCD	TCR	TCU	TFET	TK	
172.000000	.000000	.000000	.000000	1.000000	4.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
63.000000	.300000	11.000000	.000000	.000000	.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
03/14/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		21.0	17.0			
COND <sup>F</sup>	DO	PHF	PHL	TSS	TDS	
2800.000000	9.600000	7.200000	7.250000	66.000000	2782.000000	
ALK	ACID	CL	F	SO4	N-NH4	
330.000000	56.000000	10.000000	.300000	1725.000000	5.000000	
TCA	TCD	TCR	TCU	TFET	TK	
378.000000	.000000	.000000	.000000	4.000000	11.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
198.000000	1.300000	100.000000	.000000	.000000	2.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 1

SAMP DATE  
03/29/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SUMP-PIT WATER		24.0	18.5			
COND <sup>F</sup>	DO	PHF	PHL	TSS	TDS	
900.000000	8.200000	7.500000	7.050000	60.000000	784.000000	
ALK	ACID	CL	F	SO4	N-NH4	
46.000000	10.000000	8.000000	.500000	390.000000	1.000000	
TCA	TCD	TCR	TCU	TFET	TK	
171.000000	.000000	.000000	.000000	2.000000	4.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
37.000000	.500000	8.000000	.000000	.000000	.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
04/12/1977

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
29.0

WTEMP  
21.5

COND F	DO	PHF	PHL	TSS	TDS
3000.000000	7.500000	7.300000	7.050000	178.000000	4212.000000
ALK	ACID	CL	F	SO4	N-NH4
444.000000	84.000000	15.000000	.300000	2650.000000	4.000000
TCA	TCD	TCR	TCU	TFET	TK
384.000000	.000000	.000000	.000000	3.000000	13.000000
TMG	TMN	TNA	TNI	TPB	TSR
238.000000	1.800000	141.000000	.000000	.000000	3.000000
TZN					
.100000					

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
07/16/1976

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
26.8

WTEMP  
29.0

DISC	COND F	PHF	PE-EH	TSS	TDS
11.330000	2200.000000	8.200000	-78.000000	4.000000	2312.000000
ALK	CL	F	SO4	N-NH4	TCA
105.000000	15.000000	.300000	1450.000000	3.000000	355.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	6.000000	.100000
TNA	TNI	TPB	TSR	TZN	
90.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
08/02/1976

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
28.0

WTEMP  
28.0

DISC	COND F	PHL	TSS	TDS	ALK
2.830000	2200.000000	7.800000	4.000000	2744.000000	93.000000
CL	F	SO4	N-NH4	TCA	TCD
16.000000	.300000	1420.000000	2.000000	355.000000	.000000
TCR	TCU	TFET	TK	TMN	TNA
.000000	.000000	.000000	10.000000	.100000	100.000000
TNI	TPB	TSR	TZN		
.000000	.000000	2.000000	.000000		

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
08/17/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 28.0	WTEMP 28.0	DISC	COND <sup>F</sup>	DO	PHF	PHL	PE-EH
7.080000	2300.000000					8.000000	8.100000	8.200000	-90.000000
TSS	TDS					ALK	CL	F	SO4
2.000000	2746.000000					88.000000	12.000000	.200000	1925.000000
N-NH4	TCA					TCD	TCR	TCU	TFET
2.000000	335.000000					.000000	.000000	.000000	.000000
TK	TMN					TNA	TNI	TPB	TSR
11.000000	.100000					105.000000	.000000	.000000	2.000000
TZN									
.000000									

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
09/03/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 28.0	WTEMP 26.0	DISC	COND <sup>F</sup>	DO	PHF	PHL	PE-EH
5.660000	2400.000000					8.000000	8.000000	8.400000	-60.000000
TSS	TDS					ALK	CL	F	SO4
2.000000	2914.000000					110.000000	15.000000	.200000	2150.000000
N-NH4	TCA					TCD	TCR	TCU	TFET
2.000000	355.000000					.000000	.000000	.000000	.000000
TK	TMN					TNA	TNI	TPB	TSR
10.000000	.200000					95.000000	.000000	.000000	2.000000
TZN									
.000000									

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
09/17/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 28.0	WTEMP 22.0	COND <sup>F</sup>	DO	PHF	PHL	PE-EH	TSS
2500.000000	7.800000					7.400000	8.300000	-20.000000	14.000000
TDS	ALK					CL	F	SO4	N-NH4
2596.000000	118.000000					14.000000	.300000	2275.000000	2.000000
TCA	TCD					TCR	TCU	TFET	TK
365.000000	.000000					.000000	.000000	.000000	11.000000
TMN	TMN					TNA	TNI	TPB	TZN
.200000	.200000					90.000000	.000000	.000000	.000000

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
10/08/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	14.0	15.0			
DISC	COND F	DO	PHL	TSS	TDS	
4.250000	2500.000000	9.500000	8.610000	14.000000	2532.000000	
ALK	CL	F	SO4	N-NH4	TCA	
148.000000	12.000000	.300000	1675.000000	2.000000	365.000000	
TCD	TCR	TCU	TFET	TK	TMN	
.000000	.000000	.000000	.000000	10.000000	.000000	
TNA	TNI	TPB	TSR	TZN		
70.000000	.000000	.000000	2.000000	.000000		

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
10/25/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	9.0	11.0			
DISC	COND F	DO	PHF	PHL	TSS	
14.160000	2500.000000	10.800000	7.900000	8.100000	10.000000	
TDS	ALK	CL	F	SO4	N-NH4	
2610.000000	152.000000	12.000000	.300000	2050.000000	3.000000	
TCA	TCD	TCR	TCU	TFET	TK	
355.000000	.000000	.000000	.000000	.000000	10.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
.300000	75.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
11/15/1976

STATION DESC & LOCATION		WTEMP				
PP	SP DRAINAGE	11.8				
DISC	COND F	DO	PHL	TSS	TDS	
2.830000	2600.000000	7.600000	7.720000	2.000000	2546.000000	
ALK	CL	F	SO4	N-NH4	TCA	
160.000000	14.000000	.400000	1925.000000	2.000000	320.000000	
TCD	TCR	TCU	TFET	TK	TMN	
.000000	.000000	.000000	.000000	10.000000	.000000	
TNA	TNI	TPB	TSR	TZN		
75.000000	.000000	.000000	1.000000	.000000		

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
11/29/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP -7.0	WTEMP 5.0	DISC	COND <sup>F</sup>	PHF	PHL	TSS	TDS
2.830000	2600.000000					8.150000	7.900000	2.000000	2594.000000
ALK	CL					.400000	S04	N-NH4	TCA
169.000000	12.000000						1775.000000	2.000000	335.000000
TCD	TCR					.000000	TFET	TK	TMN
.000000	.000000						.000000	11.000000	.100000
TNA	TNI					.000000	TSR	TZN	
80.000000	.000000						2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
12/14/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 2.0	WTEMP 4.0	DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
2.830000	2800.000000					12.600000	8.100000	7.820000	.000000
TDS	ALK					ACID	CL	F	S04
2632.000000	180.000000					12.000000	12.000000	.400000	1925.000000
N-NH4	TCA					TCR	TCU	TCU	TFET
2.000000	310.000000					.000000	.000000	.000000	.000000
TK	TMN					TNA	TNI	TPB	TSR
11.000000	.100000					75.000000	.000000	.000000	2.000000
TZN									
.000000									

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
12/31/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP -12.0	WTEMP .0	DISC	DO	PHF	PHL	TSS	TDS
1.420000	14.800000					8.200000	7.900000	.000000	2870.000000
ALK	ACID					CL	F	S04	N-NH4
252.000000	20.000000					12.000000	.400000	2275.000000	2.000000
TCA	TCD					TCR	TCU	TFET	TK
320.000000	.000000					.000000	.000000	.000000	11.000000
TMN	TNA					TNI	TPB	TSR	TZN
.200000	80.000000					.000000	.000000	.000000	.000000

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
01/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	-3.0	1.5			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
11.330000	2500.000000	13.600000	8.000000	7.650000	.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
2930.000000	216.000000	30.000000	12.000000	.400000	1875.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
1.000000	380.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	260.000000	1.000000	80.000000	.000000	.000000	
TSR	TZN	.000000				

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
01/31/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	-10.0	.0			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
7.080000	2900.000000	14.200000	7.900000	7.600000	.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
3016.000000	230.000000	30.000000	13.000000	.400000	1825.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
1.000000	375.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	269.000000	.200000	90.000000	.000000	.000000	
TSR	TZN	.000000				

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
02/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	-2.0	1.0			
DISC	COND <sub>F</sub>	PHF	PHL	TSS	TDS	
28.310000	2000.000000	8.000000	7.500000	2.000000	1774.000000	
ALK	ACID	CL	F	SO <sub>4</sub>	N-NH <sub>4</sub>	
160.000000	6.000000	32.000000	.300000	925.000000	1.000000	
TCA	TCD	TCR	TCU	TFET	TK	
260.000000	.000000	.000000	.000000	1.000000	11.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
162.000000	.500000	60.000000	.000000	.000000	2.000000	
TSR	TZN	.000000				

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
02/28/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 6.5	WTEMP 3.5	TSS	TDS	ALK
DISC	COND <sup>F</sup>	PHL				
16.990000	1700.000000	7.120000		2.000000	1494.000000	140.000000
ACID	CL	F		SO4	N-NH4	TCA
40.000000	26.000000	.200000		750.000000	.000000	.000000
TCD	TCR	TCU		TFET	TK	TMG
.000000	.000000	.000000		1.000000	8.000000	150.000000
TMN	TNA	TNI		TPB	TSR	TZN
.500000	48.000000	.000000		.000000	1.000000	.000000

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
03/14/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 21.0	WTEMP 14.0	DO	PHF	PHL	TSS
DISC	COND <sup>F</sup>			9.600000	7.250000	7.930000	2.000000
5.660000	1800.000000						
TDS	ALK	ACID	CL	20.000000	26.000000	.300000	SO4
1824.000000	174.000000						975.000000
N-NH4	TCA	TCD	TCR				TFET
1.000000	244.000000	.000000	.000000				.000000
TK	TMG	TMN	TNA				TPB
9.000000	148.000000	.400000	52.000000				.000000
TSR	TZN						
2.000000	.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
03/29/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 21.5	WTEMP 14.0	DO	PHF	PHL	TSS
DISC	COND <sup>F</sup>			8.300000	7.400000	7.710000	30.000000
84.940000	1350.000000						
TDS	ALK	ACID	CL				SO4
1416.000000	130.000000	6.000000	17.000000				810.000000
N-NH4	TCA	TCD	TCR				TFET
1.000000	217.000000	.000000	.000000				1.000000
TK	TMG	TMN	TNA				TPB
8.000000	115.000000	.300000	40.000000				.000000
TSR	TZN						
1.000000	.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
04/12/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	29.0	18.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
5.660000	1800.000000	7.900000	8.200000	7.820000	2.000000	
TDS	ALK	ACID	CL	F	SO4	
2320.000000	154.000000	18.000000	19.000000	.300000	925.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
2.000000	219.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
8.000000	157.000000	.200000	48.000000	.000000	.000000	
TSR	TZN	.000000				
2.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
04/25/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	15.0	17.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
5.660000	2200.000000	8.100000	7.900000	8.000000	2.000000	
TDS	ALK	ACID	CL	F	SO4	
2246.000000	176.000000	8.000000	16.000000	.400000	1325.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	277.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
9.000000	171.000000	.000000	60.000000	.000000	.000000	
TSR	TZN	.000000				
1.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
05/11/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	23.5	20.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
5.660000	1400.000000	7.800000	8.350000	8.170000	28.000000	
TDS	ALK	ACID	CL	F	SO4	
2156.000000	166.000000	2.000000	19.000000	.300000	1375.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	259.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
9.000000	172.000000	.100000	55.000000	.000000	.000000	
TSR	TZN	.000000				
2.000000						

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
06/08/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 25.5	WTEMP 24.5	PHL	TSS
DISC	COND F	DO	PHF	7.920000	12.000000
1.420000	2400.000000	7.100000	8.000000		
TDS	ALK	ACID	CL	F	S04
2584.000000	138.000000	8.000000	19.000000	.400000	1775.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.900000	294.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	248.000000	.100000	76.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
06/28/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 32.0	WTEMP 28.5	PHL	TSS
DISC	COND F	DO	PHF	7.960000	24.000000
2.830000	2300.000000	6.900000	8.000000		
TDS	ALK	ACID	CL	F	S04
4602.000000	120.000000	6.000000	17.000000	.400000	1775.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.400000	300.000000	.000000	.000000	.000000	.300000
TK	TMG	TMN	TNA	TNI	TPB
11.000000	238.000000	.000000	75.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1CSUL STATION 2

SAMP DATE  
07/13/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 39.0	WTEMP 34.0	PHL	TSS
DISC	COND F	DO	PHF	8.070000	30.000000
11.330000	2250.000000	6.400000	8.000000		
TDS	ALK	ACID	CL	F	S04
2672.000000	102.000000	14.000000	15.000000	.400000	1625.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.600000	297.000000	.000000	.000000	.000000	.300000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	219.000000	.000000	78.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1

SAMP DATE  
08/11/1977

STATION DESC & LOCATION  
SP SP DRAINAGE

ATEMP  
29.0

WTEMP  
29.0

CSUL STATION 2

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
5.660000	2500.000000	6.700000	8.100000	8.120000	8.000000
TDS	ALK	ACID	CL	F	SO4
2620.000000	92.000000	4.000000	15.000000	.400000	1725.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.400000	285.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	277.000000	.000000	68.000000	.000000	.000000
TSR	TZN				
1.000000	.000000				

ANL MINE CODE IN1

SAMP DATE  
08/23/1977

STATION DESC & LOCATION  
SP EFFLUENT

ATEMP  
25.5

WTEMP  
25.4

CSUL STATION 3

DISC	COND <sup>F</sup>	PHF	PHL	TSS	TDS
16.990000	2100.000000	8.300000	8.090000	16.000000	2308.000000
ALK	ACID	CL	F	SO4	N-NH4
94.000000	6.000000	14.000000	.400000	1500.000000	1.300000
TCA	TCD	TCR	TCU	TFET	TK
278.000000	.000000	.000000	.000000	.000000	10.000000
TMG	TMN	TNA	TNI	TPB	TSR
205.000000	.000000	68.000000	.000000	.000000	1.000000
TZN					
.000000					

ANL MINE CODE IN1

SAMP DATE  
07/16/1976

STATION DESC & LOCATION  
SP EFFLUENT

ATEMP  
25.4

WTEMP  
28.0

CSUL STATION 3

DISC	COND <sup>F</sup>	PHF	PE-EH	TSS	TDS
2.830000	1900.000000	8.600000	-100.000000	26.000000	2024.000000
ALK	CL	F	SO4	N-NH4	TCA
130.000000	7.000000	.200000	1200.000000	2.000000	355.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	6.000000	.400000
TNA	TNT	TPB	TSR	TZN	
110.000000	.000000	.000000	1.000000	.000000	

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
08/02/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 35.0	WTEMP 28.0	TSS	TDS	ALK
DISC	COND F	PHL	6.000000	2778.000000		
2.830000	2400.000000	8.200000				
CL	F	SO4	N-NH4	TCA	TCD	
8.000000	.300000	1400.000000	2.000000	365.000000	.000000	
TCR	TCU	TFET	TK	TMN	TNA	
.000000	.000000	.000000	11.000000	.600000	105.000000	
TNI	TPB	TSR	TZN			
.000000	.000000	3.000000	.000000			

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
08/17/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 32.0	WTEMP 28.0	DO	PHF	PHL	PE-EH
DISC	COND F	DO	8.400000	7.800000	8.400000	7.920000	-90.000000
8.490000	2800.000000						
TSS	TDS	ALK	CL	164.000000	9.000000	.200000	SO4
20.000000	3278.000000						2200.000000
N-NH4	TCA	TCD	TCR	.000000	.000000	.000000	TFET
3.000000	390.000000	.000000	.000000				.000000
TK	TMN	TNA	TNI	100.000000	.000000	.000000	TPB
12.000000	.500000						TSR
TZN							.000000
.000000							

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
09/03/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 31.0	WTEMP 23.0	DO	PHF	PHL	PE-EH
DISC	COND F	DO	7.900000	8.200000	7.900000	8.220000	-50.000000
5.660000	2900.000000						
TSS	TDS	ALK	CL	203.000000	7.000000	.200000	SO4
34.000000	3544.000000						2150.000000
N-NH4	TCA	TCD	TCR	.000000	.000000	.000000	TFET
3.000000	365.000000	.000000	.000000				.000000
TK	TMN	TNA	TNI	150.000000	.000000	.000000	TPB
14.000000	.200000						TSR
TZN							.000000
.000000							

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
09/17/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 28.0	WTEMP 23.0	DISC 8.490000	COND <sup>F</sup> 2800.000000	DO 8.000000	PHF 8.200000	PHL 8.250000	PE-EH -60.000000
TSS 16.000000	TDS 2986.000000	ALK 156.000000	CL 8.000000	.200000	2325.000000				
N-NH4 2.000000	TCA 380.000000	TCD .000000	TCR .000000	.000000	TFET .000000				
TK 14.000000	TMN .300000	TNA 150.000000	TNI .000000	.000000	TPB .000000	TSR 2.000000			
TKZ .000000									

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
10/08/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 15.0	WTEMP 15.0	DISC 7.080000	COND <sup>F</sup> 2700.000000	DO 9.800000	PHL 8.000000	TSS 6.000000	TDS 2690.000000
ALK 194.000000	CL 7.000000	F .400000	SO4 1925.000000	N-NH4 2.000000	TCA 365.000000				
TCD .000000	TCR .000000	TCU .000000	TFET .000000	TK 12.000000	TMN .400000				
TNA 145.000000	TNI .000000	TPB .000000	TSR 2.000000	TZN .000000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
10/25/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP 9.0	WTEMP 9.0	DISC 4.250000	COND <sup>F</sup> 2700.000000	DO 11.300000	PHF 8.000000	PHL 7.950000	TSS 10.000000
TDS 2740.000000	ALK 210.000000	CL 7.000000	F .300000	SO4 1775.000000	N-NH4 2.000000				
TCA 365.000000	TCD .000000	TCR .000000	TCU .000000	TFET .000000	TK 12.000000				
TMN .000000	TNA 150.000000	TNI .000000	TPB .000000	TSR 3.000000	TZN .000000				

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
11/15/1976

STATION DESC & LOCATION  
SP EFFLUENT

DISC	COND <sup>F</sup>	DO	PHL	TSS	TDS
5.660000	2700.000000	11.800000	7.820000	4.000000	3010.000000
ALK	CL	F	SO4	N-NH4	TCA
266.000000	8.000000	.300000	2200.000000	2.000000	350.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.200000	5.000000	13.000000	.100000
TNA	TNI	TPB	TSR	TZM	
150.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
11/29/1976

STATION DESC & LOCATION  
SP EFFLUENT

DISC	COND <sup>F</sup>	ATEMP	WTEMP	TSS	TDS
4.250000	3000.000000	8.100000	7.750000	2.000000	3156.000000
ALK	CL	F	SO4	N-NH4	TCA
297.000000	8.000000	.300000	2275.000000	2.000000	375.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	14.000000	.200000
TNA	TNI	TPB	TSR	TZN	
165.000000	.000000	.000000	3.000000	.000000	

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
12/14/1976

STATION DESC & LOCATION  
SP EFFLUENT

DISC	COND <sup>F</sup>	ATEMP	WTEMP	TSS
8.490000	3000.000000	11.500000	7.600000	7.550000
TDS	ALK	ACID	CL	F
3640.000000	356.000000	48.000000	7.000000	.200000
N-NH4	TCA	TCD	TCR	SO4
2.000000	400.000000	.000000	.000000	.000000
TK	TMN	TNA	TNI	TFET
14.000000	.200000	175.000000	.000000	.000000
TZN				TSR
.000000				3.000000

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
12/31/1976

STATION DESC & LOCATION SP EFFLUENT		ATEMP -6.0	WTEMP 1.0			
DISC	DO	PHF	PHL	TSS	TDS	
8.490000	13.800000	7.300000	7.550000	.000000	3942.000000	
ALK	ACID	CL	F	SO4	N-NH4	
428.000000	56.000000	8.000000	.200000	2600.000000	2.000000	
TCA	TCD	TCR	TCU	TFET	TK	
425.000000	.000000	.000000	.000000	.000000	15.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
.400000	195.000000	.000000	.000000	3.000000	.000000	

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
01/15/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP -4.0	WTEMP 2.0			
DISC	COND F	DO	PHF	PHL	TSS	
7.080000	3000.000000	13.600000	8.100000	7.230000	.000000	
TDS	ALK	ACID	CL	F	SO4	
3660.000000	454.000000	84.000000	6.000000	.300000	2275.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	425.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
15.000000	250.000000	.900000	190.000000	.000000	.000000	
TSR	TZN	.000000				

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
01/31/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP -9.0	WTEMP .0			
DISC	COND F	DO	PHF	PHL	TSS	
7.080000	3100.000000	14.200000	7.500000	7.350000	2.000000	
TDS	ALK	ACID	CL	F	SO4	
3648.000000	464.000000	76.000000	7.000000	.300000	2200.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	410.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
14.000000	246.000000	1.200000	215.000000	.000000	.000000	
TSR	TZN	.000000				

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
02/15/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP -3.0	WTEMP 1.0	TSS	TDS
DISC	COND <sup>F</sup>	PHF	PHL	.000000	864.000000
8.490000	625.000000	7.800000	7.600000		
ALK	ACID	CL	F	S04	N-NH4
90.000000	10.000000	10.000000	.200000	465.000000	1.000000
TCA	TCD	TCR	TCU	TFET	TK
200.000000	.000000	.000000	.000000	1.000000	10.000000
TMG	TMN	TNA	TNI	TPB	TSR
75.000000	.500000	65.000000	.000000	.000000	2.000000
TZN .000000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
02/28/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 6.5	WTEMP 2.5	TSS	TDS
DISC	COND <sup>F</sup>	DO	PHL	20.000000	314.000000
12.740000	400.000000	13.100000	6.990000		
ALK	ACID	CL	F	S04	N-NH4
40.000000	16.000000	4.000000	.100000	60.000000	1.000000
TCA	TCD	TCR	TCU	TFET	TK
62.000000	.000000	.000000	.000000	2.000000	4.000000
TMG	TMN	TNA	TNI	TPB	TSR
30.000000	.200000	16.000000	.000000	.000000	.000000
TZN .000000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
03/14/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 19.0	WTEMP 13.5	TSS	TDS
DISC	COND <sup>F</sup>	DO	PHF	PHL	10.000000
14.160000	1400.000000	9.600000	7.550000	7.650000	
TDS	ALK	ACID	CL	F	S04
1340.000000	162.000000	9.000000	7.000000	.200000	550.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.000000	200.000000	.000000	.000000	.000000	1.000000
TK	TMG	TMN	TNA	TNI	TPB
8.000000	88.000000	.700000	82.000000	.000000	.000000
TSR	TZN	.000000			
2.000000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
03/29/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 24.5	WTEMP 15.5	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.550000		7.400000	102.000000
28.310000	700.000000	8.500000				
TDS	ALK	ACID		CL	F	SO4
622.000000	82.000000	6.000000		5.000000	.200000	280.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
2.000000	97.000000	.000000		.000000	.000000	3.000000
TK	TMG	TMN		TNA	TNI	TPB
6.000000	31.000000	.300000		41.000000	.000000	.000000
TSR	TZN	.000000				
1.000000						

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
04/12/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 28.5	WTEMP 19.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	8.100000		7.800000	.000000
14.160000	1600.000000	7.800000				
TDS	ALK	ACID		CL	F	SO4
1612.000000	138.000000	18.000000		6.000000	.300000	650.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
1.000000	192.000000	.000000		.000000	.000000	1.000000
TK	TMG	TMN		TNA	TNI	TPB
9.000000	90.000000	.500000		98.000000	.000000	.000000
TSR	TZN	.000000				
1.000000						

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
04/25/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 14.0	WTEMP 15.5	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	8.300000		8.150000	20.000000
11.330000	2100.000000	8.400000				
TDS	ALK	ACID		CL	F	SO4
2036.000000	182.000000	16.000000		8.000000	.300000	1075.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
2.300000	246.000000	.000000		.000000	.000000	1.000000
TK	TMG	TMN		TNA	TNI	TPB
10.000000	138.000000	.600000		117.000000	.000000	.000000
TSR	TZN	.000000				
1.000000						

ANL MINE CODE IN1

CSUL STATION 3

SAMP DATE  
05/11/1977

STATION DESC & LOCATION  
SP EFFLUENT

ATEMP WTEMP  
24.0 18.0

DISC 14.160000	COND F 2100.00000	DO 8.000000	PHF 8.000000	PHL 8.010000	TSS 16.000000
TDS 902.000000	ALK 184.00000	ACID 8.000000	CL 6.000000	F .300000	SO4 1075.000000
N-NH4 1.600000	TCA 205.00000	TCD .000000	TCR .000000	TCU .000000	TFET 1.000000
TK 9.000000	TMG 126.00000	TMN .600000	TNA 106.000000	TNI .000000	TPB .000000
TSR 2.000000	TZN .000000				

ANL MINE CODE IN1

CSUL STATION 3

SAMP DATE  
05/25/1977

STATION DESC & LOCATION  
SP EFFLUENT

ATEMP 30.5 WTEMP 26.0

DISC	COND F	DO	PHF	PHL	TSS
5.660000	2500.000000	7.100000	7.750000	8.000000	14.000000
TDS	ALK	ACID	CL	F	SO4
2426.000000	174.000000	6.000000	9.000000	.300000	1550.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.200000	252.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	173.000000	.400000	118.000000	.000000	.000000
TSR	TZN				
1.000000	.000000				

ANL MINE CODE IN1

CSUL STATION 3

SAMP DATE  
06/08/1977

STATION DESC & LOCATION  
SP EFFLUENT

DISC .280000	COND F 2500.000000	DO 7.400000	PHF 8.000000	PHL 8.150000	TSS 20.000000
TDS 2694.000000	ALK 158.000000	ACID 2.000000	CL 7.000000	F .300000	SO4 1775.000000
N-NH4 .800000	TCA 294.000000	TCD .000000	TCR .000000	TCU .000000	TFET .500000
TK 11.000000	TMG 209.000000	TMN .300000	TNA 200.000000	TNI .000000	TPB .000000
TSR 2.000000	TZN .000000				

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
06/28/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 32.0	WTEMP 28.0			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
21.240000	2900.000000	7.000000	7.800000	7.880000	8.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
3646.000000	208.000000	18.000000	8.000000	.300000	1875.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
1.400000	317.000000	.000000	.000000	.000000	.700000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	228.000000	.400000	227.000000	.000000	.000000	
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
07/13/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 41.0	WTEMP 32.0			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
8.490000	2700.000000	6.400000	7.000000	7.000000	10.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
2628.000000	108.000000	18.000000	7.000000	.400000	1875.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
1.800000	310.000000	.000000	.000000	.000000	2.000000	
TK	TMG	TMN	TNA	TNI	TPB	
11.000000	214.000000	1.500000	228.000000	.400000	.000000	
TSR	TZN					
2.000000	.100000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
07/27/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 29.0	WTEMP 26.0			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
2.830000	2800.000000	7.000000	6.400000	6.350000	26.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
3192.000000	54.000000	46.000000	13.000000	.500000	2200.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
2.700000	343.000000	.000000	.000000	.000000	17.000000	
TK	TMG	TMN	TNA	TNI	TPB	
11.000000	248.000000	2.100000	298.000000	.400000	.000000	
TSR	TZN					
2.000000	.100000					

ANL MINE CODE IN1CSUL STATION 3

SAMP DATE  
08/11/1977

STATION DESC & LOCATION SP EFFLUENT		ATEMP 32.0	WTEMP 28.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO				
8.490000	2500.000000	6.800000	7.400000		7.690000	10.000000
TDS	ALK	ACID	CL		F	S04
2764.000000	92.000000	8.000000	6.000000		.500000	1825.000000
N-NH <sub>4</sub>	TCA	TCD	TCR		TCU	TFET
1.500000	300.000000	.000000	.000000		.000000	.500000
TK	TMG	TMN	TNA		TNI	TPB
11.000000	221.000000	.800000	137.000000		.000000	.000000
TSR	TZN					
1.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
08/23/1977

STATION DESC & LOCATION BACKGROUND		ATEMP 25.0	WTEMP 23.0	PHF	PHL	TSS	TDS
DISC	COND <sup>F</sup>			7.950000	7.530000	16.000000	2054.000000
ALK	ACID	CL			F	S04	N-NH <sub>4</sub>
102.000000	8.000000	6.000000		.400000	1325.000000	.900000	
TCA	TCD	TCR			TCU	TFET	TK
261.000000	.000000	.000000		.000000	.500000		9.000000
TMG	TMN	TNA			TNI	TPB	TSR
150.000000	.300000	98.000000		.000000	.000000		1.000000
TZN							
.000000							

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
07/16/1976

STATION DESC & LOCATION BACKGROUND		ATEMP 20.8	WTEMP 22.0	PHF	TSS	TDS	ALK
DISC	COND <sup>F</sup>			9.400000	38.000000	410.000000	150.000000
CL	F	S04			N-NH <sub>4</sub>	TCA	TCD
15.000000	.200000	85.000000		2.500000	180.000000		.000000
TCR	TCU	TFET			TK	TMN	TNA
.000000	.000000	.000000		5.000000	1.000000		80.000000
TNI	TPB	TSR			TZN		
.000000	.000000	.000000		.000000	.000000		

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
02/15/1977

STATION DESC & LOCATION BACKGROUND		ATEMP 1.5	WTEMP 1.5			
DISC	COND F		DO	PHF	PHL	TSS
2.830000	300.000000	13.700000		8.000000	7.400000	.000000
TDS	ALK		ACID	CL	F	SO4
274.000000	94.000000	8.000000		19.000000	.200000	60.000000
N-NH4	TCA		TCD	TCR	TCU	TFET
1.000000	80.000000	.000000		.000000	.000000	3.000000
TK	TMG		TMN	TNA	TNI	TPB
14.000000	18.000000	.500000		15.000000	.000000	.000000
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
02/28/1977

STATION DESC & LOCATION BACKGROUND		ATEMP 4.5	WTEMP 4.0			
DISC	COND F		DO	PHF	PHL	TSS
5.660000	700.000000	12.400000		6.800000	6.500000	12.000000
TDS	ALK		ACID	CL	F	SO4
284.000000	78.000000	20.000000		21.000000	.100000	90.000000
N-NH4	TCA		TCD	TCR	TCU	TFET
1.000000	74.000000	.000000		.000000	.000000	5.000000
TK	TMG		TMN	TNA	TNI	TPB
6.000000	23.000000	.500000		10.000000	.000000	.000000
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
03/14/1977

STATION DESC & LOCATION BACKGROUND		ATEMP 21.0	WTEMP 12.0			
DISC	COND F		DO	PHF	PHL	TSS
8.490000	500.000000	9.700000		6.650000	6.610000	40.000000
TDS	ALK		ACID	CL	F	SO4
392.000000	78.000000	33.000000		27.000000	.200000	125.000000
N-NH4	TCA		TCD	TCR	TCU	TFET
.000000	78.000000	.000000		.000000	.000000	7.000000
TK	TMG		TMN	TNA	TNI	TPB
5.000000	25.000000	.600000		17.000000	.000000	.000000
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
03/29/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
BACKGROUND		25.0	16.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
49.550000	350.000000	7.800000	6.600000	7.000000	4.000000	
TDS	ALK	ACID	CL	F	SO4	
322.000000	64.000000	8.000000	18.000000	.200000	40.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	61.000000	.000000	.000000	.000000	1.000000	
TK	TMG	TMN	TNA	TNI	TPB	
6.000000	15.000000	.200000	10.000000	.000000	.000000	
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
04/12/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
BACKGROUND		28.5	20.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
5.660000	400.000000	7.700000	7.800000	7.540000	2.000000	
TDS	ALK	ACID	CL	F	SO4	
322.000000	124.000000	4.000000	25.000000	.200000	78.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
.000000	71.000000	.000000	.000000	.000000	1.000000	
TK	TMG	TMN	TNA	TNI	TPB	
3.000000	26.000000	.200000	15.000000	.000000	.000000	
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 4

SAMP DATE  
04/25/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
BACKGROUND		14.0	12.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
4.250000	500.000000	8.700000	7.750000	7.510000	.000000	
TDS	ALK	ACID	CL	F	SO4	
342.000000	192.000000	8.000000	21.000000	.300000	60.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
.200000	87.000000	.000000	.000000	.000000	1.000000	
TK	TMG	TMN	TNA	TNI	TPB	
4.000000	25.000000	.200000	19.000000	.000000	.000000	
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
08/11/1977

STATION DESC & LOCATION		ATEMP 31.5	WTEMP 23.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
2.830000	250.000000	7.400000	6.900000	6.750000	80.000000	
TDS	ALK	ACID	CL	F	SO4	
192.000000	78.000000	14.000000	15.000000	.200000	19.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
.400000	62.000000	.000000	.000000	.000000	2.000000	
TK	TMG	TMN	TNA	TNI	TPB	
6.000000	31.000000	.200000	9.000000	.000000	.000000	
TSR	TZN	.000000				
.000000						

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
07/16/1976

STATION DESC & LOCATION		ATEMP 27.5	WTEMP 32.0			
DISC	COND <sup>F</sup>	PHF	TSS	TDS	ALK	
1.130000	790.000000	9.500000	6.000000	704.000000	85.000000	
CL	F	SO4	N-NH4	TCA	TCD	
16.000000	.300000	395.000000	.500000	200.000000	.000000	
TCR	TCU	TFET	TK	TMN	TNA	
.000000	.000000	.000000	5.000000	.200000	65.000000	
TNI	TPB	TSR	TZN			
.000000	.000000	.000000	.000000			

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
02/15/1977

STATION DESC & LOCATION		ATEMP -3.5	WTEMP 1.0			
DISC	COND <sup>F</sup>	PHL	TSS	TDS	ALK	
2.830000	450.000000	7.900000	.000000	582.000000	148.000000	
ACID	CL	F	SO4	N-NH4	TCA	
4.000000	17.000000	.200000	215.000000	1.000000	145.000000	
TCD	TCR	TCU	TFET	TK	TMG	
.000000	.000000	.000000	.000000	7.000000	38.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
.300000	15.000000	.000000	.000000	.000000	.000000	

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
02/28/1977

STATION DESC & LOCATION		ATEMP 5.5	WTEMP 4.0	TSS	TDS	ALK
DISC	COND F		PHL	6.000000	454.000000	110.000000
2.830000	700.000000	7.250000	F	SO4	N-NH4	TCA
ACID	CL	.200000		180.000000	.000000	135.000000
28.000000	16.000000		TCU	TFET	TK	TMG
TCD	TCR	.000000	.000000	1.000000	4.000000	38.000000
.000000	.000000					
TMN	TNA		TNI	TPB	TSR	TZN
.200000	10.000000		.000000	.000000	1.000000	.000000

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
03/14/1977

STATION DESC & LOCATION		ATEMP 20.5	WTEMP 18.5	TSS	PHL	ALK
DISC	COND F		DO	7.850000	8.020000	.000000
5.660000	1000.000000	9.700000				
TDS	ALK		ACID	CL	F	SO4
794.000000	162.000000	16.000000	13.000000	.200000		455.000000
N-NH4	TCA		TCD	TCR	TCU	TFET
.000000	167.000000	.000000	.000000	.000000	.000000	.000000
TK	TMG		TMN	TNA	TNI	TPB
5.000000	56.000000	.200000	12.000000	.000000	.000000	.000000
TSR	TZN		.000000			
1.000000	.000000					

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
03/29/1977

STATION DESC & LOCATION		ATEMP 23.5	WTEMP 18.0	TSS	PHL	ALK
DISC	COND F		DO	7.300000	7.720000	38.000000
21.240000	800.000000	8.100000				
TDS	ALK		ACID	CL	F	SO4
744.000000	110.000000	6.000000	11.000000	.300000		375.000000
N-NH4	TCA		TCD	TCR	TCU	TFET
1.000000	154.000000	.000000	.000000	.000000	.000000	2.000000
TK	TMG		TMN	TNA	TNI	TPB
5.000000	55.000000	.300000	10.000000	.000000	.000000	.000000
TSR	TZN		.000000			
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
04/12/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
DISC	COND F	DO	PHF	PHL	TSS	
2.830000	1200.000000	7.200000	8.000000	7.720000	.000000	
TDS	ALK	ACID	CL	F	SO4	
1286.000000	196.000000	40.000000	14.000000	.200000	275.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	185.000000	.000000	.000000	.000000	1.000000	
TK	TMG	TMN	TNA	TNI	TPB	
5.000000	73.000000	.200000	13.000000	.000000	.000000	
TSR	TZN					
.000000	.000000					

ANL MINE CODE IN1CSUL STATION 5

SAMP DATE  
04/25/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
DISC	COND F	DO	PHF	PHL	TSS	
2.830000	1200.000000	8.600000	8.000000	7.890000	4.000000	
TDS	ALK	ACID	CL	F	SO4	
1034.000000	236.000000	20.000000	20.000000	.200000	430.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
.500000	179.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
4.000000	69.000000	.300000	16.000000	.000000	.000000	
TSR	TZN					
1.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
05/11/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP SP DRAINAGE	COND F	DO	PHF	PHL	TSS	
1.420000	900.000000	8.500000	8.000000	8.010000	.000000	
TDS	ALK	ACID	CL	F	SO4	
910.000000	234.000000	10.000000	19.000000	.200000	450.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
.300000	166.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
3.000000	60.000000	.300000	15.000000	.000000	.000000	
TSR	TZN					
.000000	.500000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
07/16/1976

STATION DESC & LOCATION		A TEMP	W TEMP			
PP SP DRAINAGE		23.5	26.0			
DISC	COND F	PHF	PE-EH	TSS		TDS
21.520000	2500.000000	9.000000	-120.000000	12.000000	2600.000000	
ALK	CL	F	SO4	N-NH4		TCA
130.000000	13.000000	.300000	1500.000000	8.000000	380.000000	
TCD	TCR	TCU	TFET	TK		TMN
.000000	.000000	.000000	.000000	7.000000		.300000
TNA	TNI	TPB	TSR		TZN	
95.000000	.000000	.000000	2.000000		.000000	

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
08/02/1976

STATION DESC & LOCATION		A TEMP				
PP SP DRAINAGE		28.3				
DISC	COND F	PHL	TSS		TDS	ALK
28.880000	2600.000000	8.000000	8.000000	2986.000000	130.000000	
CL	F	SO4	N-NH4		TCA	TCD
14.500000	.300000	1640.000000	3.000000	390.000000		.000000
TCR	TCU	TFET	TK		TMN	TNA
.000000	.000000	.000000	11.000000		.100000	105.000000
TNI	TPB	TSR		TZN		
.000000	.000000	2.000000	.000000			

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
08/17/1976

STATION DESC & LOCATION		A TEMP	W TEMP			
PP SP DRAINAGE		29.0	26.0			
COND F	DO	PHF	PHL	PE-EH		TSS
2700.000000	8.000000	8.200000	7.850000	-90.000000	12.000000	
TDS	ALK	CL	F	SO4		N-NH4
3130.000000	117.000000	15.000000	.200000	2050.000000	3.000000	
TCA	TCD	TCR	TCU	TFET		TK
400.000000	.000000	.000000	.000000	.000000	11.000000	
TMN	TNA	TNI	TPB	TSR		TZN
.100000	100.000000	.000000	.000000	2.000000		.000000

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
09/03/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 26.0	WTEMP 23.0	PHF	PHL	PE-EH
DISC	COND <sup>F</sup>	DO	7.400000	7.600000	7.810000	-40.000000
34.540000	2700.000000					
TSS	TDS	ALK	141.000000	CL	F	SO4
12.000000	3108.000000			12.000000	.300000	2325.000000
N-NH4	TCA	TCD	.000000	TCR	TCU	TFET
3.000000	380.000000			.000000	.000000	.000000
TK	TMN	TNA	100.000000	TNI	TPB	TSR
11.000000	.200000			.000000	.000000	2.000000
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
09/17/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 27.0	WTEMP 22.0	PHF	PHL	PE-EH	TSS
COND <sup>F</sup>	DO	8.200000	8.200000	8.200000	8.140000	-60.000000	.000000
2700.000000							
TDS	ALK	126.000000	12.000000	CL	F	SO4	N-NH4
2862.000000				12.000000	.300000	2150.000000	2.000000
TCA	TCD	.000000	.000000	TCR	TCU	TFET	TK
390.000000				.000000	.000000	.000000	12.000000
TMN	TNA	100.000000	.000000	TNI	TPB	TSR	TZN
.200000					.000000	2.000000	.000000

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
10/08/1976

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 14.0	WTEMP 15.0	PHL	TSS	TDS	ALK
COND <sup>F</sup>	DO	9.600000	7.520000	7.520000	.000000	2808.000000	158.000000
2700.000000							
CL	F	.400000	1925.000000	SO4	N-NH4	TCA	TCD
11.000000				1925.000000	2.000000	380.000000	.000000
TCR	TCU	.000000	.000000	TFET	TK	TMN	TNA
.000000				.000000	11.000000	.000000	80.000000
TNI	TPB	.000000	2.000000	TSR	TZN		
.000000							

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
10/25/1976

STATION DESC & LOCATION		A TEMP	W TEMP				
PP	SP DRAINAGE	9.0	9.5				
DISC	COND F	DO	PHF	PHL	TSS	TDS	
16.990000	2700.000000	11.000000	7.900000	7.900000	10.000000		
TDS	ALK	CL	F	SO4	N-NH4		
2632.000000	170.000000	13.000000	.400000	2050.000000	2.000000		
TCA	TCD	TCR	TCU	TFET	TK		
390.000000	.000000	.000000	.000000	.000000	11.000000		
TMN	TNA	TNI	TPB	TSR	TZN		
.000000	80.000000	.000000	.000000	2.000000	.000000		

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
11/15/1976

STATION DESC & LOCATION		W TEMP				
PP	SP DRAINAGE	5.0				
DISC	COND F	DO	PHL	TSS	TDS	
16.990000	2400.000000	12.600000	7.700000	.000000	2870.000000	
ALK	CL	F	SO4	N-NH4		TCA
188.000000	12.000000	.400000	2150.000000	2.000000	320.000000	
TCD	TCR	TCU	TFET	TK	TMN	
.000000	.000000	.000000	.000000	12.000000	.100000	
TNA	TNI	TPB	TSR	TZN		
90.000000	.000000	.000000	3.000000	.000000		

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
11/29/1976

STATION DESC & LOCATION		A TEMP	W TEMP				
PP	SP DRAINAGE	-7.0	2.0				
DISC	COND F	PHF	PHL	TSS	TDS		
14.160000	2600.000000	8.000000	7.880000	24.000000	2936.000000		
ALK	CL	F	SO4	N-NH4		TCA	
210.000000	12.000000	.400000	2275.000000	3.000000	385.000000		
TCD	TCR	TCU	TFET	TK	TMN		
.000000	.000000	.000000	.000000	12.000000	.200000		
TNA	TNI	TPB	TSR	TZN			
80.000000	.000000	.000000	2.000000	.000000			

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
12/14/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	4.5	2.5			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
28.310000	2700.000000	12.900000	7.850000	7.750000	.000000	
TDS	ALK	ACID	CL	F	SO4	
3166.000000	240.000000	28.000000	11.000000	.400000	2275.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
2.000000	385.000000	.000000	.000000	.000000	.000000	
TK	TMN	TNA	TNI	TPB	TSR	
12.000000	.500000	85.000000	.000000	.000000	2.000000	
TNZ						
		.000000				

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
12/31/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	-11.5	.0			
DISC	DO	PHF	PHL	TSS	TDS	
21.240000	14.000000	8.000000	7.900000	.000000	3312.000000	
ALK	ACID	CL	F	SO4	N-NH4	
272.000000	38.000000	12.000000	.400000	2400.000000	2.000000	
TCA	TCD	TCR	TCU	TFET	TK	
375.000000	.000000	.000000	.000000	.000000	13.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
.700000	95.000000	.000000	.000000	3.000000	.000000	

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
01/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP	SP DRAINAGE	-2.0	.0			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
14.160000	2650.000000	13.100000	8.150000	7.780000	.000000	
TDS	ALK	ACID	CL	F	SO4	
3104.000000	236.000000	38.000000	12.000000	.400000	1925.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	405.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	260.000000	.800000	90.000000	.000000	.000000	
TSR	TZN					
3.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
02/15/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP -4.5	WTEMP 1.0	TSS .000000	TDS 2530.000000	ALK 218.000000
DISC	COND F	PHL				
28.310000	2200.000000	7.850000		.000000		
ACID	CL	F		S04	N-NH4	TCA
18.000000	24.000000	.300000		1500.000000	.000000	320.000000
TCD	TCR	TCU		TFET	TK	TMG
.000000	.000000	.000000		.000000	11.000000	209.000000
TMN	TNA	TNI		TPB	TSR	TZN
.700000	75.000000	.000000		.000000	2.000000	.000000

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
02/28/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 6.0	WTEMP 2.5	TSS 2.000000	TDS 1912.000000	ALK 168.000000
DISC	COND F	PHL				
33.980000	1900.000000	7.230000		.000000		
ACID	CL	F		S04	N-NH4	TCA
50.000000	28.000000	.300000		1100.000000	.000000	283.000000
TCD	TCR	TCU		TFET	TK	TMG
.000000	.000000	.000000		.000000	8.000000	164.000000
TMN	TNA	TNI		TPB	TSR	TZN
.700000	55.000000	.000000		.000000	.000000	.000000

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
03/14/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 21.0	WTEMP 14.0	DO 9.600000	PHF 7.700000	PHL 7.850000	TSS .000000
DISC	COND F						
38.220000	2200.000000						
TDS	ALK	ACID	CL				
2292.000000	190.000000	20.000000	11.000000				
N-NH4	TCA	TCD	TCR				
1.000000	306.000000	.000000	.000000				
TK	TMG	TMN	TCU				
9.000000	184.000000	.300000	65.000000				
TSR	TZN	TNA	TNI				
2.000000	.000000	.000000	.000000				

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
03/29/1977

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
27.0

WTEMP  
16.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
70.790000	1900.000000	8.200000	7.400000	7.620000	34.000000
TDS	ALK	ACID	CL	F	SO4
1756.000000	160.000000	12.000000	17.000000	.300000	775.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
2.000000	240.000000	.000000	.000000	.000000	1.000000
TK	TMG	TMN	TNA	TNI	TPB
8.000000	143.000000	.400000	42.000000	.000000	.000000
TSR	TZN				
1.000000	.000000				

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
04/12/1977

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
28.5

WTEMP  
20.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
35.390000	2500.000000	7.700000	7.700000	7.520000	.000000
TDS	ALK	ACID	CL	F	SO4
3154.000000	194.000000	48.000000	16.000000	.400000	1625.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
3.000000	301.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	201.000000	.300000	69.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
04/25/1977

STATION DESC & LOCATION  
PP SP DRAINAGE

ATEMP  
16.0

WTEMP  
16.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
28.310000	2700.000000	8.200000	7.900000	7.810000	.000000
TDS	ALK	ACID	CL	F	SO4
2632.000000	190.000000	24.000000	16.000000	.400000	1600.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.600000	303.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	200.000000	.300000	71.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
05/11/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 18.5	WTEMP 18.5	PHF	PHL	TSS
DISC	COND F	DO	7.900000	7.900000	7.830000	.000000
33.980000	2700.000000					
TDS	ALK	ACID		CL	F	S04
2636.000000	182.000000	16.000000	14.000000		.400000	1725.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
1.500000	307.000000	.000000	.000000		.000000	.000000
TK	TMG	TMN		TNA	TNI	TPB
10.000000	200.000000	.300000	75.000000		.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
05/25/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 27.0	WTEMP 28.0	PHF	PHL	TSS
DISC	COND F	DO	6.900000	7.700000	7.750000	.000000
28.310000	2600.000000					
TDS	ALK	ACID		CL	F	S04
2720.000000	152.000000	10.000000	19.000000		.400000	1775.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
2.000000	281.000000	.000000	.000000		.000000	.000000
TK	TMG	TMN		TNA	TNI	TPB
11.000000	234.000000	.600000	73.000000		.000000	.000000
TSR	TZN					
1.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
06/08/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 21.5	WTEMP 23.5	PHF	PHL	TSS
DISC	COND F	DO	7.400000	7.800000	7.850000	6.000000
22.650000	2900.000000					
TDS	ALK	ACID		CL	F	S04
3046.000000	158.000000	20.000000	15.000000		.400000	2050.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
2.000000	327.000000	.000000	.000000		.000000	.000000
TK	TMG	TMN		TNA	TNI	TPB
12.000000	264.000000	.100000	89.000000		.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
06/28/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 29.0	WTEMP 28.0	PHF	PHL	TSS
DISC	COND F		DO	7.750000		
28.310000	2000.000000		6.900000		7.810000	.000000
TDS	ALK		ACID		F	SO4
2930.000000	120.000000		8.000000	12.000000	.400000	1375.000000
N-NH4	TCA		TCD		TCU	TFET
1.600000	300.000000		.000000	.000000	.000000	.300000
TK	TMG		TMN		TNI	TPB
11.000000	233.000000		.100000	74.000000	.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
07/13/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 36.0	WTEMP 33.0	PHF	PHL	TSS
DISC	COND F		DO	8.300000		10.000000
16.990000	2700.000000		6.300000		8.000000	
TDS	ALK		ACID		F	SO4
2432.000000	98.000000		8.000000	13.000000	.400000	1775.000000
N-NH4	TCA		TCD		TCU	TFET
1.600000	310.000000		.000000	.000000	.000000	.300000
TK	TMG		TMN		TNI	TPB
11.000000	233.000000		.100000	80.000000	.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
07/27/1977

STATION DESC & LOCATION PP SP DRAINAGE		ATEMP 23.0	WTEMP 26.0	PHF	PHL	TSS
DISC	COND F		DO	7.900000		10.000000
16.990000	2600.000000		7.000000		7.920000	
TDS	ALK		ACID		F	SO4
2946.000000	128.000000		14.000000	14.000000	.400000	1725.000000
N-NH4	TCA		TCD		TCU	TFET
1.700000	320.000000		.000000	.000000	.000000	.300000
TK	TMG		TMN		TNI	TPB
11.000000	243.000000		.100000	79.000000	.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 6

SAMP DATE  
08/11/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PP SP DRAINAGE		31.0	27.5			
DISC	COND <sub>F</sub>	DO	PHF	PHL	TSS	
33.980000	2400.000000	6.900000	7.500000	7.460000	4.000000	
TDS	ALK	ACID	CL	F	SO <sub>4</sub>	
2692.000000	116.000000	10.000000	11.000000	.400000	1775.000000	
N-NH <sub>4</sub>	TCA	TCD	TCR	TCU	TFET	
1.600000	300.000000	.000000	.000000	.000000	.000000	
TK	TMG	TMN	TNA	TNI	TPB	
11.000000	249.000000	.200000	68.000000	.000000	.000000	
TSR	TZ <sub>N</sub>					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
08/23/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
SPOIL PILE DRAINAGE		21.5	23.0			
DISC	COND <sub>F</sub>	PHF	PHL	TSS	TDS	
22.650000	2200.000000	8.100000	7.750000	22.000000	2516.000000	
ALK	ACID	CL	F	SO <sub>4</sub>	N-NH <sub>4</sub>	
126.000000	6.000000	12.000000	.400000	1450.000000	1.400000	
TCA	TCD	TCR	TCU	TFET	TK	
278.000000	.000000	.000000	.000000	.000000	10.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
226.000000	.300000	63.000000	.000000	.000000	.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
07/16/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
SPOIL PILE DRAINAGE		28.7	25.6			
DISC	COND <sub>F</sub>	PHF	TSS	TDS	ALK	
1.130000	950.000000	9.800000	96.000000	852.000000	85.000000	
CL	F	SO <sub>4</sub>	N-NH <sub>4</sub>	TCA	TCD	
16.000000	.200000	375.000000	8.000000	180.000000	.000000	
TCR	TCU	TFET	TK	TMN	TNA	
.000000	.000000	.000000	5.000000	.000000	80.000000	
TNI	TPB	TSR	TZN			
.000000	.000000	.000000	.000000			

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
02/15/1977

STATION DESC & LOCATION		A TEMP	W TEMP			
SPOIL PILE DRAINAGE		-3.5	1.0			
DISC	COND F	PHL	TSS	TDS	ALK	
1.420000	300.000000	6.550000	12.000000	408.000000	46.000000	
ACID	CL	F	SO4	N-NH4	TCA	
20.000000	24.000000	.100000	85.000000	1.000000	105.000000	
TCD	TCR	TCU	TFET	TK	TMG	
.000000	.000000	.000000	6.000000	12.000000	20.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
.700000	10.000000	.000000	.000000	.000000	.000000	

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
02/28/1977

STATION DESC & LOCATION		A TEMP	W TEMP			
SPOIL PILE DRAINAGE		6.0	3.5			
DISC	COND F	PHL	TSS	TDS	ALK	
2.830000	650.000000	4.220000	20.000000	520.000000	.000000	
ACID	CL	F	SO4	N-NH4	TCA	
116.000000	20.000000	.200000	40.000000	3.000000	80.000000	
TCD	TCR	TCU	TFET	TK	TMG	
.000000	.000000	.000000	35.000000	6.000000	28.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
1.000000	11.000000	.000000	.000000	.000000	.300000	

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
03/14/1977

STATION DESC & LOCATION		A TEMP	W TEMP			
SPOIL PILE DRAINAGE		23.0	16.0			
DISC	COND F	DO	PHF	PHL	TSS	
8.490000	600.000000	9.500000	6.350000	6.300000	90.000000	
TDS	ALK	ACID	CL	F	SO4	
466.000000	30.000000	46.000000	20.000000	.100000	235.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	89.000000	.000000	.000000	.000000	13.000000	
TK	TMG	TMN	TNA	TNI	TPB	
5.000000	26.000000	.900000	15.000000	.000000	.000000	
TSR	TZN					
.000000	.100000					

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
03/29/1977

STATION DESC & LOCATION SPOIL PILE DRAINAGE		ATEMP 24.0	WTEMP 17.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	6.250000		6.000000	198.000000
56.630000	425.000000	7.400000				
TDS	ALK	ACID	CL		F	S04
368.000000	18.000000	36.000000	17.000000		.100000	170.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
4.000000	69.000000	.000000	.000000		.000000	17.000000
TK	TMG	TMN	TNA		TNI	TPB
8.000000	23.000000	.600000	10.000000		.000000	.000000
TSR	TZN					
.000000	.100000					

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
04/12/1977

STATION DESC & LOCATION SPOIL PILE DRAINAGE		ATEMP 30.5	WTEMP 22.5	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	6.700000		6.450000	12.000000
14.160000	550.000000	7.600000				
TDS	ALK	ACID	CL		F	S04
588.000000	58.000000	42.000000	22.000000		.200000	250.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
1.000000	99.000000	.000000	.000000		.000000	11.000000
TK	TMG	TMN	TNA		TNI	TPB
4.000000	33.000000	.900000	17.000000		.000000	.000000
TSR	TZN					
.000000	.100000					

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
04/25/1977

STATION DESC & LOCATION SPOIL PILE DRAINAGE		ATEMP 14.0	WTEMP 12.5	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	6.900000		6.920000	42.000000
5.660000	600.000000	8.800000				
TDS	ALK	ACID	CL		F	S04
574.000000	86.000000	40.000000	22.000000		.200000	290.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
2.200000	101.000000	.000000	.000000		.000000	12.000000
TK	TMG	TMN	TNA		TNI	TPB
5.000000	36.000000	.900000	20.000000		.000000	.000000
TSR	TZN					
.000000	.100000					

ANL MINE CODE IN1CSUL STATION 7

SAMP DATE  
05/11/1977

STATION DESC & LOCATION  
SPOIL PILE DRAINAGE

ATEMP  
17.5

WTEMP  
13.5

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
14.160000	600.000000	8.600000	7.000000	6.780000	20.000000
TDS	ALK	ACID	CL	F	SO4
550.000000	74.000000	26.000000	18.000000	.200000	265.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
3.000000	93.000000	.000000	.000000	.000000	15.000000
TK	TMG	TMN	TNA	TNI	TPB
5.000000	34.000000	.800000	16.000000	.000000	.000000
TSR	TZN				
.000000	.100000				

ANL MINE CODE IN1CSUL STATION 8

SAMP DATE  
08/11/1977

STATION DESC & LOCATION  
PIT DISCHARGE

ATEMP  
24.5

WTEMP  
25.5

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
2.830000	640.000000	7.100000	3.500000	3.400000	30.000000
TDS	ALK	ACID	CL	F	SO4
540.000000	.000000	116.000000	10.000000	.200000	290.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.900000	92.000000	.000000	.000000	.000000	11.000000
TK	TMG	TMN	TNA	TNI	TPB
4.000000	37.000000	.900000	7.000000	.000000	.000000
TSR	TZN				
.000000	.200000				

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
07/16/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
23.2

WTEMP  
25.0

DISC	COND <sup>F</sup>	PHF	TSS	TDS	ALK
2.830000	1600.000000	8.800000	30.000000	1514.000000	145.000000
CL	F	SO4	N-NH4	TCA	TCD
10.000000	.300000	800.000000	1.000000	200.000000	.000000
TCR	TCU	TFET	TK	TMN	TNA
.000000	.000000	.000000	6.000000	.100000	110.000000
TNI	TFD	TSR	TZN		
.000000	.000000	1.000000	.000000		

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
08/02/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

WTEMP  
3.0

DISC	CONDF	PHL	TSS	TDS	ALK
4.250000	2200.000000	8.350000	16.000000	2354.000000	159.000000
CL	F	S04	N-NH4	TCA	TCD
9.000000	.300000	1100.000000	6.000000	335.000000	.000000
TCR	TCU	TFET	TK	TMN	TNA
.000000	.000000	.000000	11.000000	.300000	105.000000
TNI	TPB	TSR	TZN		
.000000	.000000	2.000000	.000000		

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
08/17/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
29.0

WTEMP  
32.0

DISC	CONDF	DO	PHF	PHL	PE-EH
5.660000	2600.000000	7.200000	7.700000	8.100000	-50.000000
TSS	TDS	ALK	CL	F	S04
24.000000	3206.000000	174.000000	10.000000	.200000	1925.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
6.000000	365.000000	.000000	.000000	.000000	.000000
TK	TMN	TNA	TNI	TPB	TSR
12.000000	.900000	100.000000	.000000	.000000	2.000000
TZN					
.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
09/03/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
29.0

WTEMP  
30.0

DISC	CONDF	DO	PHF	PHL	PE-EH
2.830000	2800.000000	7.800000	7.800000	8.170000	-50.000000
TSS	TDS	ALK	CL	F	S04
68.000000	3152.000000	214.000000	8.000000	.400000	2200.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
5.000000	365.000000	.000000	.000000	.000000	.000000
TK	TMN	TNA	TNI	TPB	TSR
12.000000	.800000	150.000000	.000000	.000000	2.000000
TZN					
.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
09/17/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
30.2

WTEMP  
26.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	PE-EH
1.420000	2500.000000	8.500000	8.200000	8.220000	-60.000000
TSS	TDS	ALK	CL	F	SO4
8.000000	2400.000000	252.000000	9.000000	.400000	1825.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
3.000000	345.000000	.000000	.000000	.000000	.000000
TK	TMN	TNA	TNI	TPB	TSR
12.000000	.400000	150.000000	.000000	.000000	2.000000
TZN					
.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
10/08/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
15.0

WTEMP  
15.0

DISC	COND <sup>F</sup>	DO	PHL	TSS	TDS
4.250000	2950.000000	9.400000	8.300000	2.000000	2960.000000
ALK	CL	F	SO4	N-NH4	TCA
304.000000	9.000000	.400000	2100.000000	10.000000	365.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	13.000000	.900000
TNA	TNI	TPB	TSR	TZN	
175.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
10/25/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
11.0

WTEMP  
10.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
4.250000	2900.000000	11.000000	8.200000	8.150000	12.000000
TDS	ALK	CL	F	SO4	N-NH4
2810.000000	230.000000	8.000000	.500000	2150.000000	12.000000
TCA	TCD	TCR	TCU	TFET	TK
355.000000	.000000	.000000	.000000	.000000	13.000000
TMN	TNA	TNI	TPB	TSR	TZN
1.400000	200.000000	.000000	.000000	2.000000	.000000

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
11/15/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

WTEMP  
7.2

DISC	COND F	DO	PHL	TSS	TDS
2.830000	3000.000000	11.900000	7.710000	40.000000	3020.000000
ALK	CL	F	S04	N-NH4	TCA
240.000000	11.000000	.600000	2050.000000	25.000000	285.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	15.000000	1.300000
TNA	TNI	TPB	TSR	TZM	
215.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
11/29/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
-6.0

DISC	COND F	PHF	PHL	TSS	TDS
2.830000	2600.000000	7.800000	8.180000	18.000000	2738.000000
ALK	CL	F	S04	N-NH4	TCA
332.000000	10.000000	.400000	1775.000000	13.000000	335.000000
TCD	TCR	TCU	TFET	TK	TMN
.000000	.000000	.000000	.000000	13.000000	1.500000
TNA	TNI	TPB	TSR	TZM	
185.000000	.000000	.000000	2.000000	.000000	

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
12/14/1976

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
5.0

WTEMP  
1.5

DISC	COND F	DO	PHF	PHL	TSS
2.830000	2800.000000	13.400000	8.250000	7.950000	10.000000
TDS	ALK	ACID	CL	F	S04
2830.000000	326.000000	36.000000	12.000000	.300000	1600.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
7.000000	310.000000	.000000	.000000	.000000	.000000
TK	TIN	TNA	TNI	TPB	TSR
13.000000	1.200000	190.000000	.000000	.000000	2.000000
	ZN				
	.000000				

ANL MINE CODE IN1

CSUL STATION 9

SAMP DATE  
02/15/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHARG

ATEMP  
-.5

WTEMP  
.0

DISC 7.080000	COND <sup>F</sup> 2100.000000	DO 14.200000	PHF 8.200000	PHL 7.720000	TSS 30.000000
TDS 1238.000000	ALK 160.000000	ACID 8.000000	CL 14.000000	F .200000	SO4 400.000000
N-NH4 6.000000	TCA 185.000000	TCD .000000	TCR .000000	TCU .000000	TFET 3.000000
TK 12.000000	TMG 79.000000	TMN .900000	TNA 95.000000	TNI .000000	TPB .000000
TSR 1.000000	TZN .000000				

ANL MINE CODE IN1

CSU II STATION 9

SAMP DATE  
02/28/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
5.0

WTTEMP  
3.0

DISC	CONDF	DO	PHL	TSS	TDS
14.160000	1250.000000	12.900000	7.300000	480.000000	1176.000000
ALK	ACID	CL	F	SO4	N-NH4
132.000000	34.000000	8.000000	.200000	400.000000	4.000000
TCA	TCD	TCR	TCU	TFET	TK
160.000000	.000000	.000000	.000000	7.000000	9.000000
TMG	TMN	TNA	TNI	TPB	TSR
75.000000	1.000000	68.000000	.000000	.000000	.000000
TZN 000000					

ANI MINE CODE TN1

CSUL STATION 9

SAMP DATE  
03/14/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

A TEMP  
20.5

WTEMP  
17.0

DISC 14.160000	COND F 600.000000	DO 9.400000	PHF 7.850000	PHL 7.610000	TSS 30.000000
TDS 330.000000	ALK 108.000000	ACID 6.000000	CL 13.000000	F .200000	SO4 65.000000
N-NH4 .000000	TCA 72.000000	TCD .000000	TCR .000000	TCU .000000	TFET 1.000000
TK 6.000000	TMG 22.00000J	TMN .200000	TNA 16.000000	TNI .000000	TPB .000000
TSR .000000	TZN 000000				

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
03/29/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
19.5

WTEMP  
19.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
70.790000	800.000000	8.200000	7.400000	7.540000	628.000000
TDS	ALK	ACID	CL	F	SO4
710.000000	100.000000	10.000000	10.000000	.300000	365.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
5.000000	103.000000	.000000	.000000	.000000	8.000000
TK	TMG	TMN	TNA	TNI	TPB
8.000000	49.000000	.500000	34.000000	.000000	.000000
TSR	TZN				
1.000000	.000000				

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
04/12/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
29.0

WTEMP  
25.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
11.330000	1900.000000	7.100000	8.000000	7.970000	30.000000
TDS	ALK	ACID	CL	F	SO4
1758.000000	220.000000	46.000000	11.000000	.300000	725.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
5.000000	197.000000	.000000	.000000	.000000	1.000000
TK	TMG	TMN	TNA	TNI	TPB
10.000000	106.000000	.800000	100.000000	.000000	.000000
TSR	TZN				
2.000000	.000000				

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
04/25/1977

STATION DESC & LOCATION  
REC STREAM BELOW DISCHAR

ATEMP  
13.0

WTEMP  
13.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
8.490000	750.000000	8.600000	8.300000	8.220000	18.000000
TDS	ALK	ACID	CL	F	SO4
798.000000	186.000000	4.000000	13.000000	.300000	300.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
1.300000	103.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
5.000000	53.000000	.200000	35.000000	.000000	.000000
TSR	TZN				
1.000000	.000000				

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
05/11/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 21.5	WTTEMP 18.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
11.330000	1000.000000	7.900000	8.000000	7.980000	212.000000	
TDS	ALK	ACID	CL	F	SO4	
2664.000000	196.000000	10.000000	8.000000	.700000	1450.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
6.500000	307.000000	.000000	.000000	.200000	6.000000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	152.000000	2.000000	121.000000	1.000000	.000000	
TSR	TZN					
2.000000	.100000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
05/25/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 28.5	WTTEMP 26.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
7.080000	5000.000000	6.800000	7.800000	7.980000	639.000000	
TDS	ALK	ACID	CL	F	SO4	
4692.000000	356.000000	30.000000	9.000000	.500000	2750.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
5.500000	356.000000	.000000	.000000	.000000	3.000000	
TK	TMG	TMN	TNA	TNI	TPB	
16.000000	249.000000	1.500000	644.000000	.400000	.000000	
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
06/08/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 23.0	WTTEMP 22.5			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
1.420000	2500.000000	7.400000	8.050000	8.190000	20.000000	
TDS	ALK	ACID	CL	F	SO4	
2566.000000	248.000000	18.000000	10.000000	.500000	1625.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
3.300000	310.000000	.000000	.000000	.000000	.500000	
TK	TMG	TMN	TNA	TNI	TPB	
11.000000	207.000000	1.000000	124.000000	.400000	.000000	
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
06/28/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 30.0	WTEMP 30.0	PHF	PHL	TSS
DISC	COND F	DO	7.900000			
7.080000	2500.000000	6.700000			8.010000	40.000000
TDS	ALK	ACID	CL		F	SO4
3110.000000	274.000000	22.000000	10.000000		.500000	1425.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
9.000000	317.000000	.000000	.000000		.000000	1.500000
TK	TMG	TMN	TNA		TNI	TPB
12.000000	217.000000	1.300000	105.000000		.400000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
07/13/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 36.0	WTEMP 34.5	PHF	PHL	TSS
DISC	COND F	DO	7.600000			
11.330000	3000.000000	6.200000			7.750000	2444.000000
TDS	ALK	ACID	CL		F	SO4
3128.000000	232.000000	28.000000	9.000000		.600000	2325.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
5.000000	452.000000	.000000	.000000		.000000	34.000000
TK	TMG	TMN	TNA		TNI	TPB
14.000000	243.000000	3.100000	217.000000		.300000	.000000
TSR	TZN					
3.000000	.300000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
07/27/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 29.0	WTEMP 27.0	PHF	PHL	TSS
DISC	COND F	DO	7.800000			
4.250000	2800.000000	7.000000			7.950000	214.000000
TDS	ALK	ACID	CL		F	SO4
3216.000000	394.000000	38.000000	6.000000		.500000	1725.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
3.800000	354.000000	.000000	.000000		.000000	3.000000
TK	TMG	TMN	TNA		TNI	TPB
12.000000	228.000000	1.600000	191.000000		.400000	.000000
TSR	TZN					
2.000000	.100000					

ANL MINE CODE IN1CSUL STATION 9

SAMP DATE  
08/11/1977

STATION DESC & LOCATION REC STREAM BELOW DISCHAR		ATEMP 33.0	WTEMP 28.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
16.990000	2800.000000	6.800000	4.250000	4.020000	384.000000	
TDS	ALK	ACID	CL	F	SO4	
3386.000000	.000000	122.000000	6.000000	1.500000	2100.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
2.500000	400.000000	.000000	.000000	.100000	14.000000	
TK	TMG	TMN	TNA	TNI	TPB	
11.000000	255.000000	5.300000	105.000000	1.400000	.000000	
TSR	TSN					
1.000000	.400000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
08/23/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 21.5	WTEMP 21.9			
DISC	COND <sup>F</sup>	PHF	PHL	TSS	TDS	
31.150000	850.000000	7.750000	7.400000	44.000000	846.000000	
ALK	ACID	CL	F	SO4	N-NH4	
94.000000	8.000000	9.000000	.300000	395.000000	.900000	
TCA	TCD	TCR	TCU	TFET	TK	
98.000000	.000000	.000000	.000000	2.000000	7.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
63.000000	1.600000	26.000000	.000000	.000000	1.000000	
TSN						
.000000						

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
09/03/1976

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 32.0	WTEMP 28.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	PE-EH	
16.990000	3000.000000	8.200000	7.300000	7.710000	-10.000000	
TSS	TDS	ALK	CL	F	SO4	
10.000000	3146.000000	448.000000	11.000000	.300000	2100.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
7.000000	400.000000	.000000	.000000	.000000	.000000	
TK	TMN	TNA	TNI	TPB	TSR	
13.000000	1.200000	150.000000	.000000	.000000	.300000	
TSN						
.000000						

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
09/17/1976

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 28.0	WTEMP 22.0	PHF	PHL	PE-EH
DISC	COND <sup>F</sup>	DO	7.000000		7.300000	.000000
5.660000	3200.000000	5.000000				
TSS	TDS	ALK	12.000000	CL	F	S04
290.000000	3164.000000	431.000000			.300000	2275.000000
N-NH4	TCA	TCD	.000000	TCR	TCU	TFET
8.000000	410.000000	.000000		.000000	.000000	.000000
TK	TMN	TNA	150.000000	TNI	TPB	TSR
13.000000	1.200000			.000000	.000000	3.000000
TNZ .000000						

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
10/08/1976

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 15.0	WTEMP 16.0	PHL	TSS	TDS
DISC	COND <sup>F</sup>	DO	7.820000		6.000000	3230.000000
7.080000	3000.000000	9.200000				
ALK	CL	F	2275.000000	S04	N-NH4	TCA
380.000000	10.000000	.400000			14.000000	380.000000
TCD	TCR	TCU	.000000	TFET	TK	TMN
.000000	.000000	.000000	5.000000		13.000000	1.700000
TNA	TNI	TPB	.000000	TSR	TZN	
175.000000	.500000	.500000		.000000	.000000	

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
10/25/1976

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 9.5	WTEMP 11.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.850000		7.750000	24.000000
7.080000	3000.000000	10.700000				
TDS	ALK	CL	.700000	F	S04	N-NH4
3208.000000	326.000000	8.000000			2050.000000	14.000000
TCA	TCD	TCR	.000000	TCU	TFET	TK
400.000000	.000000	.000000		.000000	6.000000	13.000000
TMN	TNA	TNI	.500000	TPB	TSR	TZN
1.900000	180.000000			.000000	.000000	.000000

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
11/29/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PIT DISCHARGE		-8.0	4.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
7.080000	3000.000000	11.100000	7.100000	7.750000	100.000000	
TDS	ALK	CL	F	S04	N-NH4	
3062.000000	376.000000	8.000000	.500000	1875.000000	14.000000	
TCA	TCD	TCR	TCU	TFET	TK	
375.000000	.000000	.000000	.000000	2.000000	14.000000	
TMN	TNA	TNI	TPB	TSR	TZN	
1.700000	165.000000	.000000	.000000	3.000000	.000000	

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
12/14/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PIT DISCHARGE		9.2	8.1			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
7.080000	3000.000000	11.500000	7.900000	7.660000	6976.000000	
TDS	ALK	ACID	CL	F	S04	
3196.000000	404.000000	62.000000	7.000000	.400000	1825.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
7.000000	370.000000	.000000	.000000	.000000	10.000000	
TK	TMN	TNA	TNI	TPB	TSR	
15.000000	2.100000	180.000000	.000000	.000000	2.000000	
TZN						
1.000000						

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
12/31/1976

STATION DESC & LOCATION		ATEMP	WTEMP			
PIT DISCHARGE		-13.0	1.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
7.080000	2900.000000	14.000000	7.700000	7.500000	16.000000	
TDS	ALK	ACID	CL	F	S04	
3144.000000	384.000000	62.000000	7.000000	.400000	2150.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
20.000000	345.000000	.000000	.000000	.000000	1.000000	
TK	TMN	TNA	TNI	TPB	TSR	
14.000000	1.700000	170.000000	.000000	.000000	4.000000	
TZN						
.000000						

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
01/15/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP -3.0	WTEMP 4.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.700000		7.650000	42.000000
7.080000	3000.000000	12.900000				
TDS	ALK	ACID		CL	F	S04
2936.000000	362.000000	78.000000	8.000000		.400000	1425.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
25.000000	380.000000	.000000	.000000		.000000	1.000000
TK	TMG	TMN		TNA	TNI	TPB
14.000000	205.000000	1.400000	170.000000		.000000	.000000
TSR	TZN					
3.000000	.000000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
01/31/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP -7.0	WTEMP 2.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.100000		7.100000	632.000000
7.080000	3550.000000	13.200000				
TDS	ALK	ACID		CL	F	S04
3054.000000	270.000000	66.000000	11.000000		.400000	1725.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
109.000000	400.000000	.000000	.000000		.000000	2.000000
TK	TMG	TMN		TNA	TNI	TPB
13.000000	204.000000	1.700000	140.000000		.000000	.000000
TSR	TZN					
2.000000	.000000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
02/15/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP -2.0	WTEMP .0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	8.200000		7.800000	64.000000
14.160000	3000.000000	13.900000				
TDS	ALK	ACID		CL	F	S04
3098.000000	388.000000	28.000000	11.000000		.300000	1775.000000
N-NH4	TCA	TCD		TCR	TCU	TFET
14.000000	335.000000	.000000	.000000		.000000	3.000000
TK	TMG	TMN		TNA	TNI	TPB
14.000000	209.000000	1.500000	150.000000		.500000	.000000
TSR	TZN					
3.000000	.000000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
02/28/1977

STATION DESC & LOCATION  
PIT DISCHARGE

ATEMP  
6.0

WTEMP  
3.0

DISC	COND F	DO	PHL	TSS	TDS
4.250000	2800.000000	12.900000	7.100000	70.000000	2716.000000
ALK	ACID	CL	F	SO4	N-NH4
320.000000	106.000000	7.000000	.300000	1600.000000	12.000000
TCA	TCD	TCR	TCU	TFET	TK
370.000000	.000000	.000000	.000000	4.000000	12.000000
TMG	TMN	TNA	TNI	TPB	TSR
225.000000	1.600000	143.000000	.500000	.000000	2.000000
	TZN				
	.000000				

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
03/29/1977

STATION DESC & LOCATION  
PIT DISCHARGE

ATEMP  
22.5

WTEMP  
19.5

DISC	COND F	DO	PHF	PHL	TSS
7.150000	2700.000000	8.100000	7.300000	7.600000	98.000000
TDS	ALK	ACID	CL	F	SO4
2262.000000	128.000000	18.000000	8.000000	.300000	1125.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
20.000000	286.000000	.000000	.000000	.000000	2.000000
TK	TMG	TMN	TNA	TNI	TPB
15.000000	135.000000	1.000000	154.000000	.000000	.000000
	TZN				
	.000000				

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
04/12/1977

STATION DESC & LOCATION  
PIT DISCHARGE

ATEMP  
29.5

WTEMP  
26.5

DISC	COND F	DO	PHF	PHL	TSS
5.600000	5500.000000	6.800000	7.800000	7.750000	680.000000
TDS	ALK	ACID	CL	F	SO4
5610.000000	392.000000	90.000000	10.000000	.300000	3200.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
10.000000	405.000000	.000000	.000000	.000000	9.000000
TK	TMG	TMN	TNA	TNI	TPB
19.000000	285.000000	2.300000	780.000000	.500000	.000000
	TZN				
	.000000				

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
05/11/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 23.0	WTEMP 20.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.400000		7.570000	5388.000000
2.830000	4000.000000	8.000000				
TDS	ALK	ACID	CL		F	S04
3858.000000	214.000000	20.000000	3.000000		.400000	2450.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
23.000000	390.000000	.000000	.000000		.000000	38.000000
TK	TMG	TMN	TNA		TNI	TPB
19.000000	172.000000	3.000000	458.000000		.500000	.000000
TSR	TZN					
3.000000	.300000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
05/25/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 30.0	WTEMP 25.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.500000		7.700000	10580.000000
7.080000	5000.000000	7.200000				
TDS	ALK	ACID	CL		F	S04
4620.000000	384.000000	42.000000	9.000000		.300000	2750.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
10.000000	593.000000	.000000	.000000		.000000	93.000000
TK	TMG	TMN	TNA		TNI	TPB
17.000000	331.000000	5.800000	678.000000		1.000000	.000000
TSR	TZN					
3.000000	.200000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
07/13/1977

STATION DESC & LOCATION PIT DISCHARGE		ATEMP 40.0	WTEMP 36.0	PHF	PHL	TSS
DISC	COND <sup>F</sup>	DO	7.300000		7.410000	614.000000
11.330000	3000.000000	6.100000				
TDS	ALK	ACID	CL		F	S04
2702.000000	206.000000	46.000000	9.000000		.600000	2400.000000
N-NH4	TCA	TCD	TCR		TCU	TFET
6.800000	445.000000	.000000	.000000		.000000	17.000000
TK	TMG	TMN	TNA		TNI	TPB
14.000000	229.000000	2.900000	196.000000		.300000	.000000
TSR	TZN					
3.000000	.100000					

ANL MINE CODE IN1CSUL STATION 10

SAMP DATE  
07/27/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
PIT DISCHARGE		24.0	27.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
4.250000	5000.000000	7.000000	7.300000	7.600000	828.000000	
TDS	ALK	ACID	CL	F	SO4	
5052.000000	444.000000	78.000000	6.000000	.300000	2750.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
9.000000	400.000000	.000000	.000000	.000000	14.000000	
TK	TMG	TMN	TNA	TNI	TPB	
16.000000	290.000000	2.400000	596.000000	.400000	.000000	
TSR	TSN					
3.000000	.100000					

ANL MINE CODE IN1CSUL STATION 14

SAMP DATE  
08/23/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
REC STREAM ABOVE DISCHAR		21.0	19.0			
DISC	COND <sup>F</sup>	PHF	PHL	TSS	TDS	
28.310000	2200.000000	7.800000	7.690000	69150.000000	4048.000000	
ALK	ACID	CL	F	SO4	N-NH4	
348.000000	40.000000	6.000000	.800000	1500.000000	13.000000	
TCA	TCD	TCR	TCU	TFET	TK	
302.000000	.000000	.000000	.000000	82.000000	17.000000	
TMG	TMN	TNA	TNI	TPB	TSR	
279.000000	3.000000	105.000000	.500000	.000000	2.000000	
TSN						
.100000						

ANL MINE CODE IN1CSUL STATION 14

SAMP DATE  
02/15/1977

STATION DESC & LOCATION		ATEMP	WTEMP			
REC STREAM ABOVE DISCHAR		2.0	.0			
DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS	
4.250000	300.000000	14.000000	8.300000	7.200000	.000000	
TDS	ALK	ACID	CL	F	SO4	
256.000000	48.000000	6.000000	16.000000	.200000	59.000000	
N-NH4	TCA	TCD	TCR	TCU	TFET	
1.000000	80.000000	.000000	.000000	.000000	1.000000	
TK	TMG	TMN	TNA	TNI	TPB	
12.000000	18.000000	.500000	15.000000	.000000	.000000	
TSR	TSN					
.000000	.000000					

ANL MINE CODE IN1

CSUL STATION 14

SAMP DATE  
02/28/1977

STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARGE

ATEMP WTEM  
6.0 3.0

DISC	COND F	DO	PHL	TSS	TDS
1.420000	600.000000	12.800000	7.100000	8.000000	344.000000
ALK	ACID	CL	F	S04	N-NH4
98.000000	18.000000	32.000000	.200000	64.000000	.000000
TCA	TCD	TCR	TCU	TFET	TK
74.000000	.000000	.000000	.000000	.000000	9.000000
TMG	TMN	TNA	TNI	TPB	TSR
26.000000	.200000	11.000000	.000000	.000000	.000000
TZN					
.000000					

ANL MINE CODE IN1

CSUL STATION 14

SAMP DATE  
03/14/1977

STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARGE

ATEMP WTEMP

DISC	COND F	DO	PHF	PHL	TSS
1.420000	500.000000	9.500000	7.700000	7.650000	4.000000
TDS	ALK	ACID	CL	F	SO4
72.000000	154.000000	8.000000	27.000000	.200000	35.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.000000	89.000000	.000000	.000000	.000000	1.000000
TK	TMG	TMN	TNA	TNI	TPB
8.000000	21.000000	.300000	12.000000	.000000	.000000
TSR	TZN				
.000000	.000000				

ANL MINE CODE IN1

CSUL STATION 14

SAMP DATE  
03/29/1977

STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARGE

ATEMP 20.0 WTEMP 18.5

DISC 5.660000	COND <sup>F</sup> 450.000000	DO 8,300000	PHF 7.500000	PHL 7,510000	TSS 12.000000
TDS 04.000000	ALK 90.000000	ACID 6.000000	CL 22.000000	F .300000	SO4 20.000000
N-NH4 1.000000	TCA 74.000000	TCD .000000	TCR .000000	TCU .000000	TFET 1.000000
TK 8.000000	TMG 18.000000	TMN .200000	TNA 10.000000	TNI .000000	TPB .000000
TSR .000000	TZN .000000				

ANL MINE CODE IN1CSUL STATION 14SAMP DATE  
04/12/1977STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARATEMP  
30.0WTEMP  
22.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
.570000	550.000000	7.600000	7.900000	7.840000	.000000
TDS	ALK	ACID	CL	F	SO4
464.000000	200.000000	32.000000	26.000000	.200000	80.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.000000	88.000000	.000000	.000000	.000000	1.000000
TK	TMG	TMN	TNA	TNI	TPB
6.000000	33.000000	.200000	24.000000	.000000	.000000
TSR	TZN				
.000000	.000000				

ANL MINE CODE IN1CSUL STATION 14SAMP DATE  
05/11/1977STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARATEMP  
18.0WTEMP  
13.0

DISC	COND <sup>F</sup>	DO	PHF	PHL	TSS
.280000	500.000000	8.700000	7.850000	7.720000	.000000
TDS	ALK	ACID	CL	F	SO4
428.000000	226.000000	6.000000	24.000000	.300000	75.000000
N-NH4	TCA	TCD	TCR	TCU	TFET
.200000	98.000000	.000000	.000000	.000000	.000000
TK	TMG	TMN	TNA	TNI	TPB
6.000000	27.000000	.300000	17.000000	.000000	.000000
TSR	TZN				
.000000	.000000				

ANL MINE CODE IN1CSUL STATION 14SAMP DATE  
08/23/1977STATION DESC & LOCATION  
REC STREAM ABOVE DISCHARATEMP  
20.4WTEMP  
19.0

DISC	COND <sup>F</sup>	PHF	PHL	TSS	TDS
1.420000	375.000000	7.800000	7.710000	39.000000	324.000000
ALK	ACID	CL	F	SO4	N-NH4
130.000000	8.000000	17.000000	.300000	39.000000	.300000
TCA	TCD	TCR	TCU	TFET	TK
57.000000	.000000	.000000	.000000	.000000	8.000000
TMG	TMN	TNA	TNI	TPB	TSR
21.000000	.100000	7.000000	.000000	.000000	.000000
TSR	TZN				
.000000	.000000				

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